DOMESTIC ENGINEERING

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Mental Sanitation for 1912

There are only 50 weeks left to the year 1912. Only young, inexperienced or ignorant people imagine that 50 weeks is a long time. The fact of the matter is that to most of us 1911 seems ages ago and we can not explain what on earth has become of the first 13 days of January, 1912.

Since time is passing so rapidly and there is so much work to be done by us all to advance the cause of sanitation, let us see to it that we can rely on keeping ourselves in a condition of mental sanitation during the year. This form of sanitation is more important than all others. Have you ever considered it?

It is the quality, not the quantity, of thought that determines the absolute worth of anything and everything we do. You can "work your head off," in common parlance, and yet if your thinking has not been clear and accurate your labors will be worthless. No action can rise higher than its thought-source.

Few people think with any degree of strength; fewer people still think with accuracy. They probably would if they knew that thought is a substance in the same manner that light, heat, electricity and X-rays are substances, and the nature of the thoughts they generate determine in great measure the degree of their successes or failures.

Several thousand plumbers and steam-fitters are engaged at this moment in thinking about their business, its prospects, the best methods for protecting it and developing it. I say "thinking" in a general sense.

Thoughts of this nature are really only floating through their minds. In an indefinite way they "hope" that things will get better, they "mean" to go after business, they will "agree" with the other fellow if his ideas are the same as theirs. Most of them are only thinking they are thinking.

If several thousand plumbers and steam-fitters really started thinking about their business in earnest; if they gave serious consideration to the things that make for the up-building of the great sanitary industry of the country; if they all thought together, a curbstone plumber and pipe-skinning fitter would be as rare as a June bug in December. The science of thought-dynamics is only now beginning to be appreciated.

Mental sanitation is what we need. We can read all the books and papers in the world, but unless our thinking on the things we read is clean, clear and accurate, the knowledge we may have gained will be of no avail to us. Any thinking which does not lead to right action is poor thinking; it is unsanitary thinking.

In order to keep the House of the Mind in a sanitary condition, these things must we observe.

Whatever comes before us, we must pay it undivided attention, be the matter great or small. To study a subject for 30 minutes with unwavering attention, accomplishes more than to follow it a half-day with a wandering mind. Most people's thinking is on the order of a kitten at play, now striking at the swinging string, then chasing its tail and again darting into another room without any apparent reason. Let us concentrate our thoughts.

Next, we should consider what comes before us and do some original thinking on it. It is poor policy to accept or reject opinions or views without doing some thinking of our own on the matter. Too many resolutions, ordinances and by-laws have sprung into existence through the mental laziness or apathy of those who said "Aye" when they would have said "No" if they had thought about the matters presented.

Lastly, and of greatest importance, the attainment and maintenance of mental sanitation can only be secured by the cultivation of a broad tolerance. No progress can be made without this.

Great changes are likely to occur in the plumbing and heating industries and we will be asked to consider opinions that differ from ours, theories that would shatter some of our cherished traditions and facts that give the lie to tenets of the trade we have deemed unassailable. In all our considering, truest progress will be made by the exercise of respectful tolerance. The mental sanitarian has for his creed's foundation the belief that he can change foundation and creed of yesterday and today for the better foundation and creed of tomorrow.

Climbing the Ladder

By "Noswad"

Chapter VI.

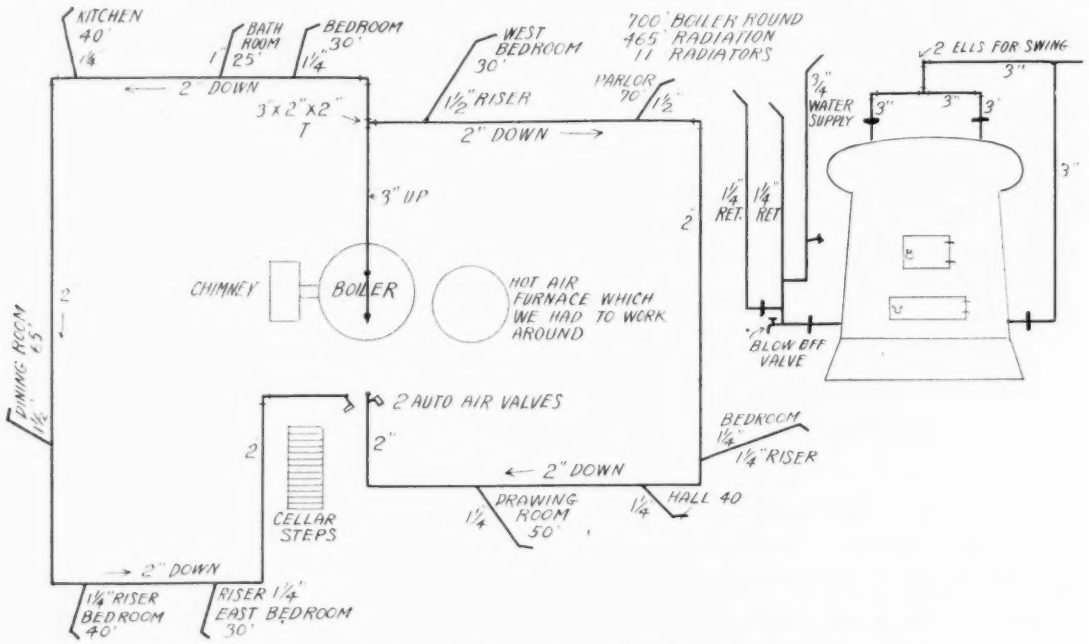
During the fall of 1908 I gave quite a little consideration as to which had the advantage for heating a residence, steam or hot water. I came to the conclusion that, if properly installed and handled, steam had the advantage considering everything. I foresaw that it would be necessary to have the boiler large enough for a long feed at a low pressure, practically at vapor; this would also mean that there would be a little more radiation required than for an ordinary steam job.

Here are some of the advantages I felt the steam job had. First of all, there was no danger of a steam job freezing. This I knew would be a big talking point, there being quite number of families in my town who went south for a part of the winter. This would do away with the necessity of draining the water from the system before leaving, and also the miserable job of filling the plant on returning home; which would mean it would be several hours before the house would be comfortably warm. With hot water one has to perspire and "grin and bear it" as best he can; you heat up the house on a chilly morning but cannot get rid of the surplus heat when the atmosphere warms up outside.

Radiators could be almost half the size, taking up much less valuable space, which is quite an item. Positive operation of every radiator.

After making my plans regarding such a system, I determined to talk steam on the above lines to the first prospective customer, and suffice to say he fell for it; resulting in a thoroughly satisfied customer and a paying advertisement. After this I installed job after job with perfect satisfaction to each and every owner. I should like to see any one try to convince any of these owners that they had not gotten hot-water "beat all to pieces."

The system I decided on was the dry return circuit system, using a round boiler up to 600 ft. of radiation and a square sectional boiler above that amount. The round



Plan of Dry Return Circuit Heating System.

There would not be much fear of the water in a steam boiler freezing in the average basement, and on returning home the owner could build a fire and have the radiators hot and every room warmed in a little over half an hour. This alone seemed enough to warrant the experiment.

There would be no danger of leaking radiators causing untold damage to wall and ceiling decorations and to furniture.

Only one pipe to radiators, simplicity of installation, quick action, a wide range of temperature, a certainty of obtaining all the heat required even in the most severe and windy weather, a pressure of even five or six lb. being available if necessary. If the correct pitch were given the piping, a system as noiseless as hot water.

A system which could be cooled down almost immediately, which is a decided advantage in spring and fall. boiler I found to be very effective for from five to 15 or 16 radiators.

The sketch shows one of these jobs; you will notice that the main is hooked up to both openings of the boiler, the full size of openings. The main is then connected to a return opening by a 3-in. equalizing pipe; no doubt a 1¼-in. pipe would have been sufficient, but in this particular job I had a very low basement to contend with, the ends of the returns being only 9 in. above the water-line. The mains were made one size larger than was absolutely necessary, under ordinary circumstances, for the same reason.

There was no drain in the cellar and water sometimes got into the basement during heavy rains, so the owner would not allow a pit to be dug. I am rather averse to pits anyway as they are liable to check the draft where

there is a poor chimney, so I prefer to increase the size of mains, in order to obtain the desired result.

There was another difficulty to contend with in this installation. There was a hot-air furnace in the basement which could not be torn down until the steam job was in operation, it being the middle of December and very severe weather at the time. The hot-air pipes were very close to the joists, the furnace set 7 ft. away from the chimney, the smoke-pipe running straight to the chimney, right across the space where the boiler was to set. The smoke-pipe had to be diverted, running it around to the other side of the chimney. The direction of two hot-air pipes was changed, and the mains run clean through three others. As soon as steam was on the job, the old hot-air furnace was taken down, the steam pipes and boiler were covered and the job finished off. I'll tell you it required all kinds of patience to get that little job in, but we had the satisfaction of seeing it work like a charm when finished.

In mild weather this job has frequently been run 48 hours on one feed of hard coal; how about that for economy? You will notice an automatic air-valve is placed on the end of each main; these relieve the mains of air quickly and give a rapid circulation to the steam. Automatic air-valves were also attached to each radiator, saving the owner the troublesome task of letting the air out of each individual radiator. I use a valve with a metal float, as I have found that those with composition are liable to give more or less trouble when brought into contact with heat.

Most of the houses in my town have gas installed but, strange to say, very few of them have gas lights in the basement. This is rather peculiar, the basement being the one place you would expect to find lights. This being the case, I always carry two or three gas brackets and burners with me, and ask the owners to allow us to cut the lines and put in lights, which is a whole lot better than working in the dark, with only candles or torches. We are in almost every case asked to leave them when the job is finished, and charge them.

In very dark basements, where there is no gas, I use gasoline flare lamps such as the show people and street auctioneers use; they are the only thing where gas is not obtainable.

(To be continued.)

APPRECIATE THE "HUMDINGER" ISSUE.

Thomas A. Fernley, secretary of the National Association of Jobbers of Plumbing Supplies, 505 Arch St., Philadelphia, writes:—"I want to congratulate you heartily upon the most excellent New Year's edition of your paper. It is a beautiful number and one of which you may well be proud."

Chas B. Ball, chief sanitary inspector, Chicago, writes:—"I have taken much pleasure in reading your New Year's number and congratulate you on the success with which you have collected a vast mass of valuable information respecting plumbing appliances and the general status of the plumbing art.

"The expressions, which so generally favor the making of a uniform plumbing code which should be of use throughout the entire United States, are surprising as indicating the advance of opinion in regard to this matter since it was first proposed at the initial meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers by President H. B. Davis, on January 23, 1906. I have no doubt that it may be successfully accomplished in the near future if the various interests concerned are willing to devote time and money to it. Personally, it does not appear to me that the time is quite ripe for making an entire code. I have for a year or two past favored the drafting of a code which should regulate underground construction. I see no reason why sewers and drains cannot be the subjects of a uniform code throughout the United States.

"I fear that the questions involved in soil, waste and vent-pipes would not at present receive sufficient consideration so that a worth-while result could be achieved, but I am sure that this could be accomplished after the other had been successfully put in force. One reason why we are not quite ready for a code in this regard is because of the absence of scientific data respecting sizes, which will largely be settled by tests in the next year or two."

Thos. J. Claffy, secretary-treasurer of the American Society of Inspectors of Plumbing and Sanitary Engineers, and assistant chief sanitary inspector, Chicago, writes:—"Let me congratulate you on your New Year's number of 'Domestic Engineering' for 1912. The cover design is a clever work of art and is peculiarly appropriate for such a magazine.

"The accounts of plumbing practice and plumbing business in the different states and in Canada are particularly interesting to the trade. It is an index of the practices in the different cities, an indication of how plumbing is designed, to some extent, and shows that a few live ones are in the plumbing and heating business.

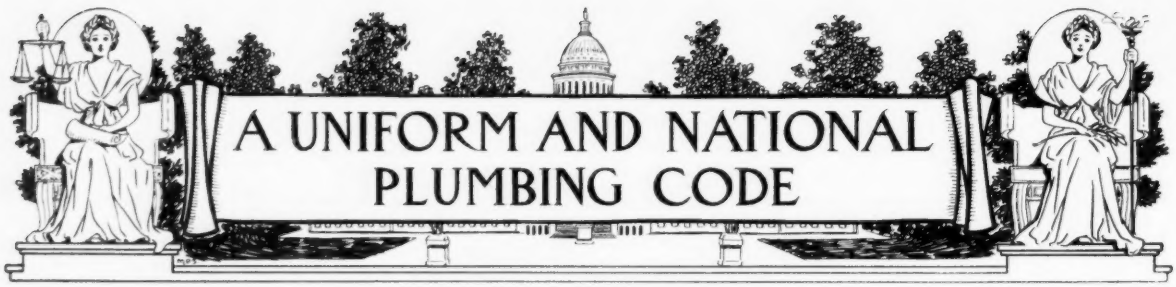
"The index in the back of the magazine is one of the most valuable things that has come out for some time. It affords a ready means of finding where particular lines of goods are manufactured and by whom, and makes a short-cut to information on that subject in the plumbing and heating business.

"The article in the December 9th issue on sewer ventilation and the intercepting trap is a good find. It ought to be an inducement to sanitary engineers in this country to conduct experiments on their own account along the same lines. I do not see how any practical plumber can swallow whole the doctrine that sewer-air is cleaner than the air of the street. Any man who has wielded the ladle and cloth knows that he has gone home with a headache many a time when forced to work in a closed bath-room with a wide-open soil-pipe pouring the sewer-air in upon him. Instances of sewer gas poisons are so numerous and so well known that the story is really too old for repetition. A few of us are from Missouri; a few of us also ought to have the brains and the wherewith to conduct some live experiments.

"May your magazine continue its good work and grow and prosper with the years."

O. W. Gleason, manager of branch office of Peerless Selling Co., 1418 W St., N. W., Washington, D. C.: "The pure-gold nuggets presented to the trade in your New Year's number have pleased me mightily. They are right and will do a world of good. I wish you a year of increasingly good work."

Joseph C. Bixby, president of the J. C. Bixby & Son Co., 322 S. 19th St., Omaha, Neb.: "I wish to testify after enjoying the 'Humdinger' issue of 'Domestic Engineering,' that it was a very fat turkey, and thoroughly done, making every one feel like asking for a second helping of every part. Congratulations!"



By Henry D. McCormack, C. E.

XXII.

Settlement and Shrinkage of Buildings.

When we look at a mass of steel and masonry, towering 200 to 400 feet in the air, and realize that it houses sometimes more than 2,000 people, as many as the entire population of some small cities, we are inclined to consider those buildings firm and immovable as the Rock of Gibraltar. This very appearance of solidity and immovability has led us into an error of roughing-in, which has proven destructive in the past and must be corrected in the future, before plumbing practice can be considered to have attained that degree of perfection at which we are aiming in our uniform and national plumbing code. Ten years ago, if you had asked the plumbers throughout the United States whether there was a movement in sky-scraper buildings of steel construction, which would affect the piping, to a man they would have said "No." Ask them today, or those of them who have had experience in that class of work, and they will quickly tell you that there is more destructive movement in tall buildings than in small ones, and that the damage resulting is enormous.

Let us look into the matter, then, and see what settlements, shrinkages and other movements take place in buildings. First, it might be well to state that the settlement of buildings is understood and recognized by architects and engineers. In all schools teaching these branches of the industrial arts, it is taught that all tall and heavy buildings erected on other than bed-rock, settle from three to five inches, due to the compressibility of the soil. Evidence of this subsidence of buildings can be seen by any observer, in the cracks which appear in walls, floors, ceilings and tiling of most buildings, showing unmistakably that some movement has taken place since the building was erected.

But it is specific cases which show best the point we are trying to bring out and emphasize, and in this capacity we will take as an example the city of Chicago. If the subsidence of buildings constituting the greater part of the business portion of the city of Chicago continues, that city will have not one but scores of leaning towers, similar to the Leaning Tower of Pisa. The Building Department there declares that virtually all of the immense buildings and sky-scrapers of the downtown district, costing millions of dollars, are "out of plumb and lean out far over the plumb-line."

The Great Northern Hotel there is partially carried on jacks, as are a number of other buildings, which, periodically, as they settle, are jacked up. When no further settlement will take place, the walls will be filled in with masonry and the jacks removed.

Henry Ericsson, building commissioner, characterized the Unity Building as "unsafe but not dangerous" and ordered that it be straightened so that the top of its south side would no longer be **30 in. outside of the foundation.** "Practically every sky-scraper in Chicago leans out of plumb," declared Commissioner Ericsson in an interview recently when asked whether other orders are to follow similar to the one directed to the Unity building. "Of the tall buildings, the Masonic Temple is the next after the Unity building in being seriously out of plumb. However, it is of steel construction, and I do not consider there is any danger. The Ellsworth Building, which has been referred to repeatedly, I know leaned over considerably some years ago, but I do not think it is in any danger now. It is impossible to prevent the big buildings here from leaning. Some of them are not straight when they are finished, but that does not impair their safety."

"Do any of them lean over as far as four feet?" he was asked.

"Gracious, no!" he exclaimed. "Why, the Leaning Tower of Pisa is only nine feet out of plumb, and it has stood for centuries that way. It is probably safe to say that every building in the city leans more or less. If they are on floating foundations, they also settle gradually."

Here, then, is the evidence of an expert, and one who is in position to know, having under his charge the buildings of the city about which he speaks. A very significant part of his remarks is the closing sentence, in which he shows that there are **two different and district movements in buildings.** In the first place they gradually lean from the plumb, due to wind-pressure or other forces acting upon them; in the second place, when on floating foundations, they settle, due to their weight.

But there is still another movement of tall buildings not mentioned by the commissioner, and this new movement cannot be better described than by quoting from an article on the subject lying before me on the desk.

"If one remembers that an inch, although a good deal on a man's nose, is very little in a hundred feet, one will not be surprised to learn that all high structures sway in the air. The Eiffel Tower swings perceptibly with the wind, and even stone shafts like those of Bunker Hill and Washington Monuments move several inches at the top. In these cases the cause of the action is not only the wind, but the heat of the sun. The side that is towards the sun expands during the day, more than the side in shadow. An interesting device has been employed to show the movement of the dome of the Capitol at Washington. A wire was hung from the middle of the dome inside the building, down to the floor of the rotunda, and on the lower end of the wire was hung a 25-lb. plumb-bob. In the lower point of the plumb-bob was inserted a lead pencil, the point of which just touched the floor. A large sheet of paper was spread out beneath it. As the dome moved, it dragged the pencil over the paper every day. The mark made was in the form of an ellipse six inches long. The dome would start moving in the morning as soon as the rays of the sun began to act upon it; and slowly, as the day advanced, the pencil would be

dragged in a curve across the paper until sundown, when a reaction would take place, and the pencil would move back again to its starting point. But it would not go back again over its own pencil track, for the cool air of night would cause the dome to contract as much on the one side as the sun had made it expand on the other, and so the pencil would form the other half of the ellipse, getting back to the original point all ready to start out again at sunrise."

Can any doubt remain in the minds of the craft, that when these up-and-down movements, together with the side movements, take place, something must happen to the plumbing system if it be perfectly rigid? A building which moves 30 in. out of plumb, and settles at the same time from 3 to 5 in. into the soil, then sways at the top, in the form of an ellipse, daily, cannot do so without springing some of the joints or breaking some of the branches; while in buildings of less movement the damage, or danger of damage, is still present and should be provided against.

So far we have considered only the settlement, leaning and swaying of buildings, but not the shrinkage. It might be well to state at the outset that in tall buildings of fireproof construction there is no shrinkage that need be taken into account. But here is a pregnant fact, and one which must be kept constantly in mind by the code commissioners: Of all buildings erected, only 3 per cent are of fireproof construction; the rest, 97 per cent, being of wooden floor construction. And in every building of wooden floor construction the shrinkage must be taken into consideration, for it is an important factor in the permanence of the plumbing.

All wood shrinks. That is a truism which should need no proof, but in compiling a model plumbing code nothing must be taken as self-evident. Experience, however, has shown most of us the damage resulting from this cause. After a building dries out, doors stick and will not close; the floor has receded from the baseboard leaving a gaping opening in which one could put his fingers; casings open at the seams and joints, while cracks appear everywhere. Experience, then, would prove the shrinkage of timbers, but good engineering practice demands **how much** the shrinkage is. The amount can be readily found in the following table, compiled from data furnished by the United States Government, Department of Agriculture, Division of Forestry, in Bulletin 10, which shows that the kinds of timber used in house framing, shrink 4 per cent upon drying.

Table of Shrinkage of Timbers.

Size of Green or Wet Timber	Amount Lost by Shrinkage, 4 %	Size or Depth of Timber When Dry
6 in.	.24 in.	5.76 in.
8 in.	.32 in.	7.68 in.
10 in.	.40 in.	9.60 in.
12 in.	.48 in.	11.52 in.
14 in.	.56 in.	13.44 in.
16 in	.64 in.	15.36 in.
18 in	.72 in.	17.28 in.
20 in.	.80 in.	19.20 in.

It will be noticed that 12-in. joists, the kind commonly used in residence work, shrink .48 or practically ½-in. upon drying, while the larger sizes shrink even more, until we reach the 20-in. joists, the kind commonly used in business structures, which we find shrink over ¾-in. Surely, some provision should be made for this shrinkage of timbers, which is inevitable, and which occurs in 97 per cent of the buildings erected. If stacks are run and firmly supported in place, as they should be, and branches taken off for closets, or other fixtures which rest on the floor, the floors laid and the fixtures set while the joists are green and wet from rain and mortar, as they always are, then, when the joists dry out and shrink something in the roughing-in beneath the floor must give, or the fixtures will be held above the floor-line a distance equal to the shrinkage.

A rigid connection is wrong in principle, here, for the closet must be kept on the floor, otherwise it or the floor-flange connection will be broken, and besides, the crevice under the closet will form an unsanitary and filthy receptacle for dirt and vermin.

There are numerous ways in which a closet can be roughed-in so it will always remain on the floor, following the receding floor line as the joists shrink, and this without danger to piping, fixtures, or fittings; and roughing-in that will allow for this should be required by every code.

And how are the shrinkages and settlements provided for in the four codes we selected as types? You can search them through from cover to cover and not find one word bearing on the subject. It is but fair to state, however, that those codes were compiled long before the necessity for flexibility in drainage systems was realized, and there was but little literature pertaining to the subject to guide the framers at that time. If we want to find the modern trend, therefore, we must look to the more recently compiled codes to see what modern thought is doing along that line. The latest code of merit to be adopted is that of the state of Ohio, and, while it takes no account of the settlement of buildings, it has this to say regarding the shrinkage, in connection with earthenware water-closets.

"In wooden joist construction, the connection between the earthenware and soil pipe shall have a 'suitable' length of lead pipe between the wiped joint and under-side of the floor. The word "suitable" in the code is construed to mean: "Sufficient to allow for necessary buckling, according to construction."

Truly, "the world do move," and in this simple provision Ohio has erected a finger-post, pointing the way so we can amplify it to take in both settlement and shrinkage, in our uniform and national plumbing code.

(To be continued.)

OBITUARY.

Frank P. Wyne.

Frank P. Wyne, secretary and treasurer of the Illinois Pump & Brass Co., Peoria, Ill., died at his residence in that city on Wednesday evening, January 3rd, in his 55th year. He had been associated with the Illinois Pump & Brass Co. for the last three years and had a very large acquaintance in the plumbing trade. He is survived by his wife, a son and a daughter.

John Galvin.

John Galvin, one of the best known business men of Brattleboro, Vt., where he had been engaged in the plumbing and heating business for many years, died at his home in that city just after Christmas. He was 52 years of age and a native of Richmond. While a resident of that town he was a leader in town, county and state politics.

John W. Stewart.

John W. Stewart, for more than 30 years engaged in the plumbing business at Lowell, Mass., and prominent in social circles in that city, died on New Year's Day after an operation for appendictis. He had been ill less than a week. A widow, one son and one daughter survive.

The Siphonage or Blowing Out of Trap-Seals in Modern Office Buildings

By Thos. J. Claffy, Assistant Chief Sanitary Inspector, Chicago

During the summer of 1910 I was requested to look over the plumbing in one of our modern office-buildings to assist in determining the cause of nuisances which had annoyed the tenants and managers since its erection about five years previous. When the main toilet-room on the top floor was in heaviest use, the trap-seals on all floors below were either siphoned or blown out.

There was trouble from the time of its complete occupancy and several plumbers had given up as useless any efforts to improve conditions.

The toilet-rooms for all office employees were on the 18th floor.

In the men's room 22 water-closets, 6 urinals, 3 lavatories and a slop sink; and in the women's room, adjoining, an equal number of closets and lavatories, were connected to a soil-pipe. Each fixture-trap was revented and the vents extended through the roof at different places as indicated on the plan.

On the 17th floor a water-closet, lavatory, bath-tub and shower-bath were connected to the same soil-pipe with a revent connection from each fixture to a main vent. Below this a lavatory on each floor to the 4th was connected in like manner. On the 4th floor two lavatories, four water-closets and a slop-sink were connected to the same soil-pipe with revents connected as indicated.

In the course of our examination it was found that the main soil-pipe was 6 in. and the vent 3 in. and each fixture-trap was individually revented and the pipes above the roof were clear. The soil-pipe was carried along the ceiling of the basement and dropped down about 6 ft. to the point where it passed out to the street-sewer.

A relief-vent had been taken off the line near the ceiling and extended outside the building, terminating in a return-bend close to the wall and side-walk. Its only function seemed to be deluging with sewage the passing public and it was promptly plugged.

Our first impression was that an obstruction existed somewhere in either the soil or vent-pipe. A small electric light was let down the vent-pipe to the ceiling of the second floor, showing that this line was clear. We then dropped a line down the soil pipe, with like results. The next step was to break a fitting out of the revent line on the 15th floor, which demonstrated that there were no obstructions at that point. A plumber who had been called in to stop the nuisance had extended an independent 4-in. line from the basement-ceilng, inserting a back-water valve as shown in Fig. 2 to the fourth floor, and connected the fixtures to it. This stopped all trouble on the fourth floor, but only served to increase it on the floors above.

It was impossible to reconnect the 3-in. main vent to the 6-in. soil-pipe near its base on account of its inaccessibility and the necessity of closing the toilet-room for any part of a business day. Even this would not have provided the desired relief, as was afterwards demonstrated.

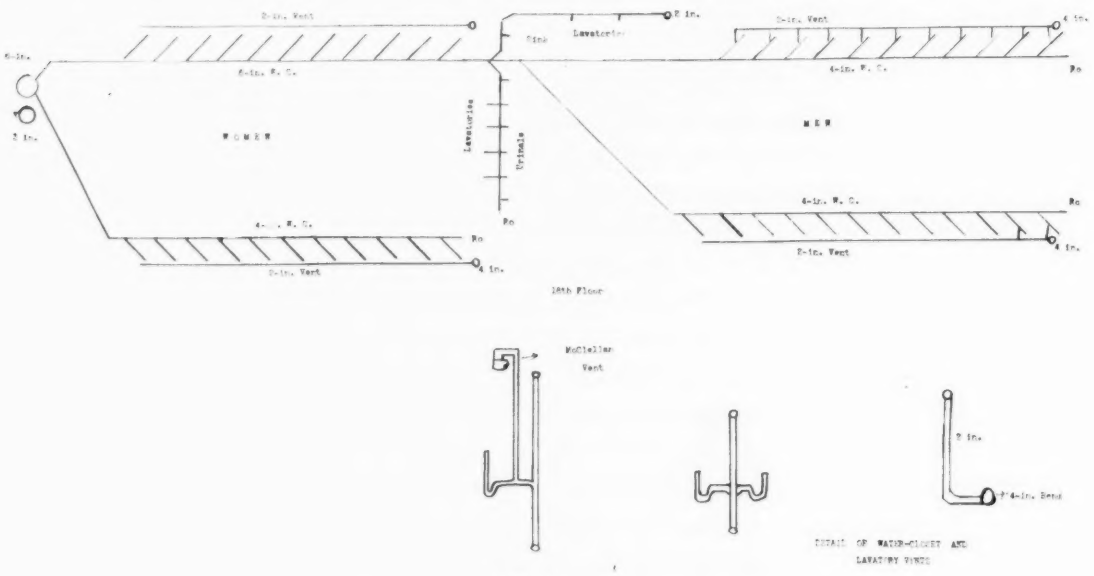


Fig. 1.

How to give relief and at the same time avoid unnecessary tearing out of walls and fixtures and shutting down the main toilet-room during business hours, was indeed a most perplexing problem. It offered no small amount of study.

The fifteenth floor offered the most desirable point for access to the waste and vent-lines in the wall. The fixture-trap was removed and a tee inserted between it and the vent fitting, Fig. 2. A piece of 1½-in. pipe was extended up about 5 ft. with a McClellan vent on the top. This showed agitation of the mercury seal at all times, and an unusual agitation during periods of heavy use of the main toilet-room. It failed at such times to prevent loss of water-seal, though it afforded relief during moderate use of fixtures above or below.

The water-closet on the 17th floor was taken up and

observations made from there. The alternate inrush and outrush of air immediately blew out any light or broke any paper pasted over the orifice. The water-seal in the trap of the shower-bath oscillated as usual, but was not blown out or siphoned.

There was no perceptible change in the fluctuations of the McClellan vent on the 15th floor nor any difference in safety of trapped fixtures below this point, which siphoned or "blew out" just the same. This was proof of the great air compression within the lines of piping and of the impossibility of solving the problem by extending relief-vents from so high a point.

The removal of the McClellan vent on the 15th floor leaving a 1½-in., opening in the vent and waste made no noticeable difference on floors above or below while of course protecting the trap-seal at this point.

We were now convinced that relief must be provided nearer the base of the soil-pipe, and with as large a pipe as could be installed.

During a lull in the business activities on the third and fourth floors, plumbers were put to work locating the tee-fitting from which the toilet-room fixtures had been disconnected.

They finally found a 6 x 4-in. 90-deg.-Y plugged. It was left so and wainscot and floor set back in place, to wait for a convenient Saturday night and Sunday when the real work of installing proper relief-vents could be carried on.

It was found impossible to run a pipe even 2-in. in diameter up alongside the soil and vent-stacks, so after what seemed an endless amount of heart-breaking delays, a pipe-shaft nearly 50 ft. away was found suitable for carrying a vent to the roof.

Before measurements were taken experiments were made with 2, 3 and 4-in. pipes connected to the 90-deg.-Y at the fourth floor. With a 2-in. pipe the relief was scarcely noticeable; the 3-in. pipe was better, and a 4-in. pipe prevented loss of trap-seal, though it did not prevent agitation.

Measurements were taken, the way prepared, and the 4-in. relief-vent from the fourth floor to the roof finally installed. It was noticed that as its height increased, its efficiency diminished. There was more agitation or oscillation of the trap when it was finally extended to the roof than when it had reached only to the sixth floor, though it really solved the problem by preventing loss of trap-seal.

In making the connection to the soil-pipe, care was exercised in preventing use of any of the fixtures above. When the extension reached the sixth floor, the plug was removed and the fixtures discharged in the main toilet-room.

When the discharge approached the volume of a rush-hour service, the spray carried by the compressed air wet the hand placed over the open vent. It seems incredible that so much compression could be obtained in any ordinary soil-pipe, but experience has demonstrated it.

Several weeks after the completion of the relief-vent installation, measurements of the air-velocity at the roof were taken.

An ordinary derby hat when placed over the open 4-in. relief-vent was blown off by the outrush of air. An anemometer placed over it showed a velocity of 1,600 ft. per minute during a period of only ordinary use of the toilet-rooms. This would easily reach 2,000 ft. during rush-hours or heavy use.

The air-currents in the 6-in. soil and 3-in. vent-pipes were not steady, reversing themselves several times in a minute and showed a velocity from 0 to 100 ft. per minute in the 6-in. and 40 ft. per minute in the 3-in. lines.

The test of air-currents could not be carried on satisfactorily on account of the inclemency of the weather and the lack of proper facilities.

By plugging the 4-in. relief-vent, the speed of air-currents in the 6-in. soil-line was increased to 250 ft. per minute and to 240 ft. per minute in the 3-in. line. An actual

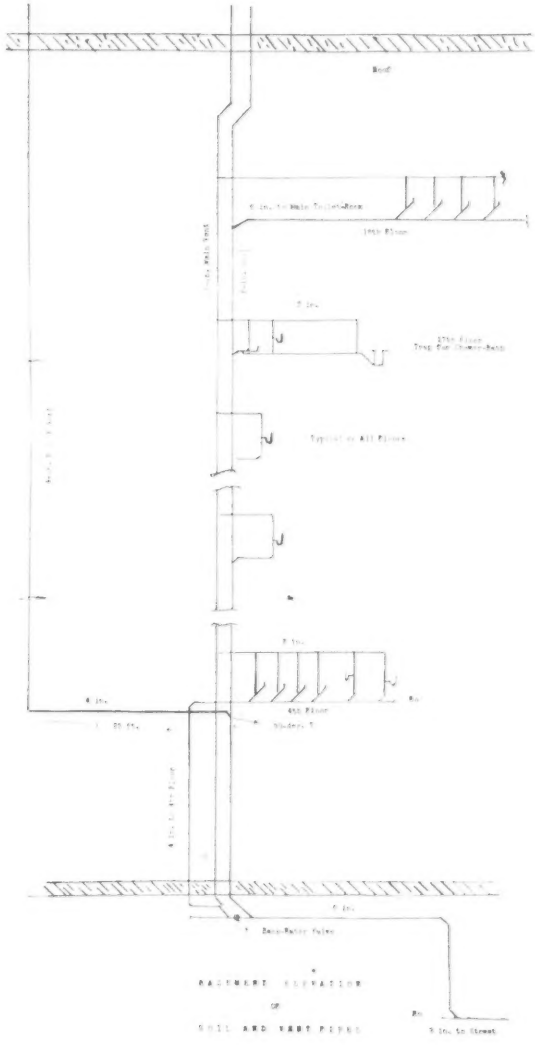


Fig. 2.

indication of the speed could be obtained with an anemometer on each of the lines at the same time.

It is to be regretted that more accurate measurements could not be taken, and closer study of air-currents made. Many things have to be arranged to suit the convenience of building management, occupants and investigators, and so we had to be satisfied with what we could get.

Since the inception of this case we have sought the experiences of others and have found them but repetitions of our own, though the degree of compression was less and the means of inserting relief-vents simple.

One instance was in a 12-story building with a system of drainage direct to the river. The outlet-pipe was dipped about a foot below mean water-level in the river.

Experiments were made with 2, 3 and 4-in. pipes for relief-vents with results same as ours. A 4-in. relief-vent was carried up above the roof from the suspended soil-pipe on the basement ceiling.

I have noticed for some time that trap-seals in urinals and water-closets in our high buildings are considerably agitated during periods of heavy use of the toilet-rooms, despite the fact that each trap has an individual revent-connection and the main vent is either three or four inches in diameter.

In designing plumbing systems, we have surely not carefully considered the enormous striking force of a body of water at the bottom of a 260-ft. soil-pipe line, nor have we thought much of the great velocity of air in a vent-line connected to it.

We have failed to estimate correctly the loss of efficiency due to friction and eddies, in spite of such length, and with straight tees and common short ells.

Even clever engineers seem to have overlooked this, for some of these systems were designed by our leading architects. It is quite possible that much is left to the specifications in our municipal ordinances.

Here was an instance of woeful inadequacy in spite of the fact that the installation complied with the ordinance in every way.

We know that the 3-in. vent in this case was not large enough and that it was necessary to install another 4-in. vent pipe to prevent disaster.

We do not claim safety even now and are still ignorant of what constitutes a properly proportioned vent-pipe in such a case. We may assume that a 6-in. vent in place of a 3-in. pipe would have given sufficient volume to prevent excessive velocity and consequent loss of trap-seal, inasmuch as its area would be 28.274 sq. in. while the combined areas of the 3 and 4-in. pipes would be only 20.635 sq. in.

I believe a 6-in. vent-line would have afforded the necessary relief, provided it were properly connected near the base of the soil-pipe and other connections made to it as were made to the 3-in. line.

At the same time I could not attempt to assume responsibility for its sufficiency.

This is a very important point in plumbing, and sanitary science demands that it be cleared up at once.

Our facilities for testing such systems are unfortunately limited to the "jobs" under way, or where they have been in use.

Attempts will be made very shortly to conduct a series of experiments along these lines at the University of Illinois under the auspices of the A. S. I. of P. & S. E.

Prof. J. McL. White has offered to this society the facilities of the university and its teaching force for experiments and tests in this or any other field of sanitation.

It is unfortunately true that concentrated efforts for such experimental work are not made by the different associations in plumbing science.

By concentration of efforts and work of committees from the master plumbers, journeymen plumbers and plumbing inspectors' associations on a problem of this kind, some definite results would be obtained which could only reflect credit upon all parties concerned.

NEW PLUMBING INSPECTOR FOR ATLANTA, GA.

C. O. Harmsen, one of the most experienced plumbers of Atlanta, who has been a resident of the city for many years, was recently elected by the board of health as city plumbing inspector. Mr. Harmsen succeeds Louis F. Severs, who recently resigned.

January 16, 17 and 18, 1912.—The 24th annual convention of Iowa Master Plumbers' Association, at Des Moines, Ia. Headquarters will be established at the Hotel Savery. The officers of the association are: President, Chas. G. Bosch, Burlington, Ia.; vice-president, Frank Vollers, Keokuk, Ia.; secretary, W. B. McCarten, Dubuque, Ia.; treasurer, J. N. Gearen, Sioux City, Ia.

January 23, 24 and 25, 1912.—The 18th annual meeting od the American Society of Heating and Ventilating Engineers, at the Engineering Societies Bldg., 29 West 39th St., New York City. The officers of the society are: President, Reginald Pelham Bolton, New York City; first vice-president, Prof. John R. Allen, p. t. Constantinople, Turkey; second vice-president, A. B. Franklin, Boston; secretary, W. W. Macon, 29 West 39th St., New York City.

January 24 and 25, 1912.—The 20th annual convention of the Illinois Master Plumbers' Association, at Decatur, Ill. Headquarters will be established at the St. Nicholas Hotel. The officers of the association are: President, F. U. Patterson, Springfield, Ill.; vice-president, Wm. J. Hilliard, Elmhurst, Ill.; secretary, W. C. Haviland, Aurora, Ill.; treasurer, Thomas Cody, Peoria, Ill.

February 14 and 15, 1912.—The 18th annual convention of the Master Plumbers' Association of the State of Wisconsin, at Oshkosh. The officers of the association are: President, Geo. F. Reeke, Green Bay; vice president, Louis Sonntag, Sheboygan; secretary, P. H. Ryan, Appleton; treasurer, F. C. Kuetemeyer, Milwaukee.

March 12 and 13, 1912.—The 24th annual convention of the New York State Association of Master Plumbers in Troy, N. Y. The sessions will be held in the Germania Hall and headquarters will be established at the Rensselaer Hotel. The officers of the association are: President, John H. Moran, Albany, N. Y.; vice-president, Frank B. Lasette, New York City; secretary, James H. Doody, Albany, N. Y.; treasurer, Chas. A. Campbell, Watertown, N. Y.

May 7, 8 and 9, 1912.—The seventh annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers, in St. Louis, Mo. The officers of the society are: President, Martin Conroy, St. Paul, Minn.; first vice-president, John Hefferman, Houston, Tex.; second vice-president, Lawrence J. Lawler, Pittsburgh, Pa.; secretary and treasurer, Thos. J. Claffy, City Hall, Chicago.

May 13, 14 and 15, 1912.—The annual triple convention of the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association at Norfolk, Va. Headquarters will be established at the Monticello Hotel. F. D. Mitchell, 309 Broadway, New York City, is secretary-treasurer of the American Supply and Machinery Manufacturers' Association.

May 14-17, 1912.—The sixth annual convention of the Master Boiler Makers' Association, at Pittsburgh, Pa. Headquarters will be established at the Fort Pitt Hotel.

June 25, 26 and 27, 1912.—The fourth annual meeting of the National District Heating Association, in Detroit, Mich. The officers of the association are: President, A. D. Spencer, Detroit, Mich.; first vice-president, Warren Partridge, Springfield, Ill.; second vice-president, R. D. de Wolf, Rochester, N. Y.; third vice-president, Cadwallder Evans, Jr., Pittsburgh, Pa.; secretary-treasurer, D. L. Gaskill, Greenville, O.

She—I hear that you have lost your valuable little dog, Mr. Dudley.

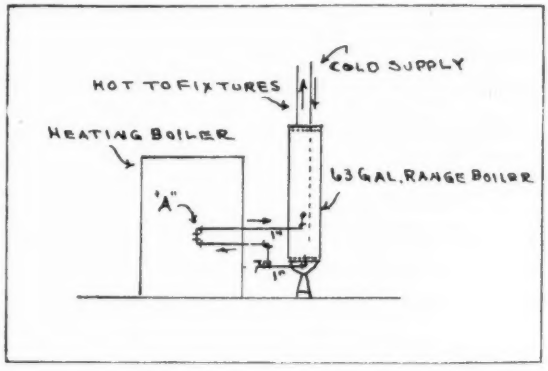
He—Yaas, in a railway accident. I was saved, but the dawg was killed.

She (shocked)—What a pity!

IS THERE DANGER OF AN EXPLOSION FROM EXCESSIVE PRESSURE ON THESE BOILERS OR CONNECTIONS?

Editor "Domestic Engineering":—Quite an argument has arisen amongst some of the students, whether boilers 200-lb. test will or will not blow up after a certain pressure, or some of the connections. Now our water-pressure is 60 lb. per sq. in. One of the boilers, a 66-gal., is connected to a No. 22 hotel range and a 6-hole stove also.

The other, a 63-gal. boiler, is heated by a 1-in. pipe, as shown in sketch, connected into the furnace of a large stationary boiler which supplies the building with steam heat. It gets so hot that it is impossible to put your hand on it, and when the faucets are opened steam issues for quite a while. All connections are new and they are both first-class boilers. We cracked a water-jacket in the range and an elbow at A on the drawing (furnace-heated).



Is This Installation Safe?

Now my argument is that enough pressure can form in either tank to burst the tank, or some of the connections, at what must naturally be the weakest spot, if the water is not drawn off occasionally after a certain heat.

What is your opinion?

Montevideo. F. C. O'N.

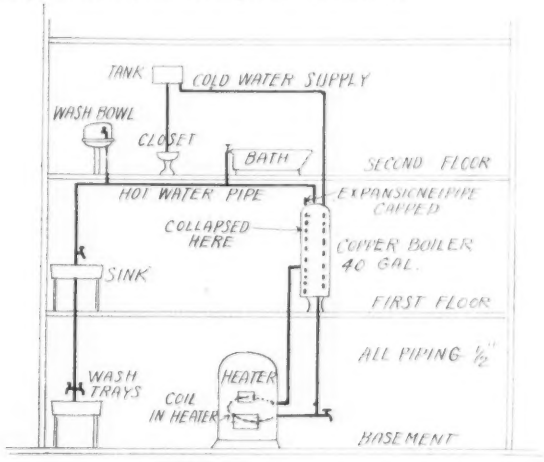
Our answer will have to be in general terms. The sketch shows the connections to the range-boiler heated by a coil in the furnace of the steam-heating boiler. The breaking of the ell at point marked A might be due to a defective ell being used, which due to expansion and contraction, or some other cause, burst. We would advise the reduction of the amount of piping in the coil exposed to the fire, as it is very evident that it contains too much heating-surface when it generates steam. In the coil exposed to the direct heat from the fire, 2½ sq. in. of surface should be ample for each gallon of water to be heated; 63 gal., in this case, will require 3 ft. of 1-in. pipe in addition to the surface presented by the nipple and two ells. This may have to be varied a trifle according to whether the furnace is fired heavy or light. As we take it, the cold-water supply comes from the street mains, and unless a check-valve has been placed in this pipe between the street and the boiler, which should never be done, the pressure will not rise above 60 lb., for the simple reason that any excess pressure above this amount which might be created by the heating of the water, can expand back into the street main. If a check-valve were placed in the cold-water supply, a dangerous pressure could easily be raised with continuous firing, which might result in some damage. Personally, we are not in favor of carrying 60-lb. pressure on the piping in a building, and would advise the use of a pressure-reducing valve, which would cut the pressure down to just a trifle more than that required to raise the water to the highest fixtures. This lesser pressure will not be so hard on the fixtures.

WHAT'S WRONG WITH THIS HOT-WATER JOB?

Editor "Domestic Engineering":—We enclose a sketch of the hot-water piping of a house in which we recently installed a water-heater. The plumbing had already been done when we connected the heater to the boiler.

The connections having been made, all cocks in the system were opened, and the plug in supply-pipe in bath-room tank removed to allow the copper boiler to fill. A short time after the water started to run the boiler collapsed very near the top, as shown on plan.

The expansion pipe, as you will notice on plan, is capped. This we know is wrong, but we cannot see that it is responsible for the collapse of the boiler.



What's Wrong With This Job?

We have no doubt that the wide experience of plumbing and heating engineering possessed by your readers will enable them to locate the trouble, which we regret to say we are unable to do.

Boston. S. S. J.

First Contractor—"Have you signed the contract for that job you've been figuring?"

Second Contractor—"No, I don't believe I'll take it."

First Contractor—"What's the matter? Are you losing enough without it?"

"Even the grip has its good points," said pretty Mrs. Jones, "it's apt to make a charming widow of one."

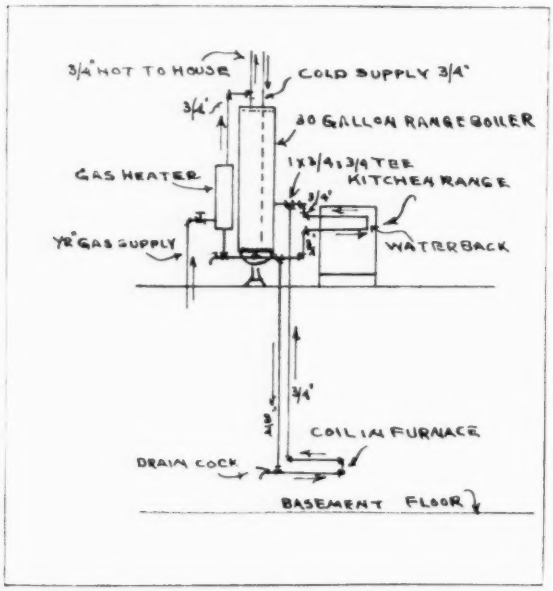
"Well, it'll never make a charming widow of you," said her grumpy husband; "I'd cut my throat before I'd let it do that."

SEVERAL CAUSES FOR "HAMMERING" IN RANGE-BOILER AND HOW TO PREVENT IT.

Editor "Domestic Engineering":—What method would one take to stop hammering in range-boiler when the boiler is connected with range on first floor, also with furnace in basement, and bath-room upstairs. When water gets hot it starts hammering. Would air-chambers in the bath-room stop same, and how many would be necessary, and what fixtures would it be best to put air-chambers close to? E. K. M.

Des Moines.

The sketch below shows the proper method of connecting waterbacks in the kitchen-range and in the furnace,



Proper Method of Connecting Waterbacks.

and also gas water-heater for summer use, and we would advise this plan, omitting the gas heater if not desired. Notice that the pipe is enlarged where the hot-water lines from the two waterbacks join the opening in the side of the boiler.

On the supposition that the cold-water supply comes from the street mains, and there is no noise when water is drawn from the hot or cold faucets when there is no fire in the range or furnace, then the noise can be traced directly to the waterbacks or connections as follows:

1. The waterbacks may contain too much heating-surface.

2. The piping may be so installed as to cause the hot-water currents to buck each other.

3. Piping may be trapped or have air-pockets.

4. Waterbacks may be partially stopped up with dirt.

Regarding No. 1, if the waterback contains 2½ in. of surface exposed directly to the fire for each gallon of water to be heated, this should be of ample capacity to heat the water in one hour. This would be 75 sq. in. of surface for a 30-gal. boiler, or equivalent to approximately 2 ft. of ¾-in. pipe. This is based on experience gained from a large number of installations. This may have to be increased or reduced at times to meet unusual conditions of heavy or light fires. Too much surface will produce the hammering, and air-chambers will not relieve this trouble.

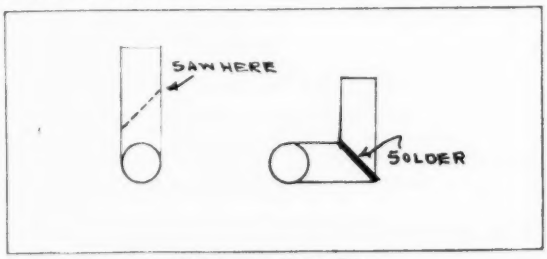
No. 2 cannot be commented on except to make the statement, "Do not put your piping in in such a manner as to cause the water-currents to buck each other." The arrows in the sketch will make this clear.

No. 3. If the hot-water piping is trapped, you will get an irregular flow of water and also the hammering noise. This is because the air which forms in the traps or pockets is forced ahead when the pressure rises, and the hot water, striking the cooler piping which was filled with air, causes the hammering sound. Moral, grade your piping and avoid the traps, pockets, sags, or whatever you choose to call them.

No. 4. The waterback being partially choked up may allow the water to heat so rapidly that steam will form, and on this steam forcing its way through the stoppage to the boiler and the cold water rushing into the waterback to take its place, the result will be "hammering," and very often a split waterback. Remedy, put in a new waterback. If the water has much lime or magnesia in its composition, it is cheaper and better to put in a new waterback than to try and clean the lime out with muriatic acid, as is often done, but not with any marked degree of success.

WHAT TO DO WHEN "WALLS MOVE" AFTER ROUGHING-IN BEFORE INSTALLATIONS ARE MADE.

Editor "Domestic Engineering":—I had a job to finish contract installing fixtures on another man's roughing-in, and when I set lavatory in corner I found I could not set the closet-tank (a low-down outfit) straight, so I took the 2-in. flush ell and made an offset like the sketch and it works all right.



Emergency Flush Ell.

I sawed the flush ell on the dotted line in Fig. 1 and then soldered the joint, which made an offset like Fig. 2. Have you any suggestions to make? R. J.

St. Louis.

Regarding the offsetting of the flush ell on the closet, the correspondent was evidently "up against it," and got out of it the best way he could at the price he had made for installing the fixtures.

This may be of interest to others in the trade, who have perhaps found that "walls sometimes move" from the time the job was roughed-in to the the time for finishing. Carpenters put the partitions any place else than where they told you, or move any of the pipes? "Nevaire."

LEGAL DECISIONS

CONSTRUCTION OF WARRANTY AS TO HEATING HOUSE.

What was called a "combination furnace," in this case one in which either coal or wood could be used as fuel, was sold with a garantee that it would heat the purchaser's house properly in the coldest weather. But it would not heat the house properly in the coldest weather when fired with wood only, except by means of excessive firing and attention. By using coal or coke as fuel it would, however, heat the house in accordance with the garantee. Was there, under these circumstances, any breach of the garantee? The Supreme Court of Wisconsin holds, A. B. Wheeler & Son Co. vs. Edenhofer, 133 Northwestern Reporter, 22, that there was not. It says that there was no express understanding that the furnace would heat the house at that time. The fact was undisputed that it would do so when the proper fuel was used. It was the duty of the purchaser to use that fuel.

INVALID CONTRACT FOR INSTALLATION OF HEATING SYSTEM IN PUBLIC BUILDING.

In a case where the president of a heating and plumbing company had been elected one of the school trustees of a city before a contract was entered into for the installation by the company of a heating system in a public school building, qualifying afterward as such trustee, but before the work was completed, the Supreme Court of Indiana holds that the contract was void, as against public policy, and that the trustees could be enjoined at the suit of a single taxpayer from performing the contract.

Nor does the court consider that it saved the contract that it contained a stipulation that, should such president of the company qualify as school trustee before such plant was installed, the company should employ the services of a first-class heating engineer, to be approved by the other two members of the school board, to inspect and decide if the plant had been installed and worked according to the plans and specifications. The court says, Noble vs. Davison, 96 Northeastern Reporter, 325, that the school board had no right to delegate the performance of such duties, even temporarily, to a contractor's employe, whether such duties were to be performed gratuitously, or otherwise.

This court has ever steadfastly adhered to the rule which invalidates all agreements injurious to the public, or against the public good, or which have a tendency to injure the public. Contracts belonging to this class are held void, even though no injury results. The test of the validity of such agreements is the tendency to public injury, regardless of the actual intent of the parties, and regardless of actual results.

On the ground that one seeking equity must do equity, it was urged that the school held the benefit of the labor and materials furnished by the plumbing company, and that it would be inequitable to adjudge an avoidance of the contract without restoration to the plumbing company of the reasonable value of all work done and materials furnished; but, in answer, it was sufficient to say, the court declares, that an equitable right cannot be founded on a violation of law. This contract revealed a palpable attempt to evade the law.

The contention that where the threatened injury to the complainant is small, and the granting of an injunction will work great hardship to the defendants, relief should be denied, the court answers by saying that this suit was brought by the complainant as a taxpayer. Whether his taxes were large or small could not in any manner affect his rights as a suitor in such capacity. There can be no balancing of equities in matters arising out of contracts prohibited by law, or contrary to public policy.

BASIS REQUIRED FOR EXPERT EVIDENCE ON HEATING.

In an action brought to recover the value of work done and materials furnished in the installation of a heating plant, the defendant pleaded an express contract under which he claimed that the plaintiff agreed to install in his house, for a sum not to exceed $1,500, such a heating plant as would heat the house in cold weather to his reasonable satisfaction, which had not been done. The defendant contended that the failure to so heat the house was due to the inadequate size of the boiler, while the plaintiff insisted that the boiler was large enough, but that the defendant's radiators were too small. The plaintiff obtained a judgment, but that is reversed by the Court of Appeals of New York for error in the admission of evidence.

Among the witnesses called for the plaintiff was an expert in reference to heating apparatus for buildings. He was allowed to testify as to the radiating surface required to heat the defendant's rooms without having stated what were the dimensions of the rooms, and as to the capacity of the boiler (which he had never seen), basing his opinion upon the test of another boiler not clearly shown to have been of the same type, and without giving the facts upon which he based his conclusion. The court holds, Weibert vs. Hanan, 95 Northeastern Reporter, 688, that this was error, it being a general rule in regard to the opinion evidence of experts that the facts upon which the opinion of the witness is founded must be laid before the trial court either by assuming them in a hypothetical question or by the testimony of the expert himself if he has observed them.

GOVERNMENT CONTRACTS TO BE AWARDED.

Supervising Architect James Knox Taylor, Treasury department, Washington, D. C., will receive sealed proposals as follows:

Until 3 p. m. on Feb. 7, 1912, for the construction of a one-story and basement brick and stone-faced building, covering approximately 5,000 sq. ft. ground area, tin roof, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, for the U. S. post-office at Goshen, Ind.

Until 3 p. m. on Feb. 15, 1912, for the construction, including plumbing, gas-piping, heating apparatus, electric conduits and wiring, and lighting fixtures, of a one-story and basement nonfireproof building, of approximately 4,235 sq. ft. ground area, brick-faced, with stone trim, for the U. S. post-office at Bonham, Tex.

All proposals should be in accordance with drawings and specifications, copies of which may be obtained from the custodians of the above sites or from the office of the Supervising Architect at Washington, D. C.

Bayfield, Wis.—J. C. Mundt has opened a plumbing establishment on Broad street.

CHICAGO JOTTINGS.

By Diogenes.

To the query: "How's business?" a local heating contractor recently came back in good Yankee fashion by asking another question which pretty clearly expresses the sentiment held by most of the heating men in Chicago on this perennial topic:

"Ever read the poem, 'Smile, d—— you, smile'?" he asked.

Across the river fifteen minutes later another maker of summer's genial heat assured the interviewer that business was fine enough—nothing wrong with it so far as he could see. No distorted vision that either, for what he sees is a left-over from 1911, good for a year to come at least. But he is a rare bird. Add him to a few others who say that in spite of Bill Taft and questions of "jurisdiction," 1911 has been fairly good picking, and you have the Optimists' club, a select coterie, spare in membership and timid in its enthusiasm.

Over against it the prevailing attitude of the majority is "Smile, d— you, smile." And there is more than irony or facetious philosophy in this aphorism. To the more than casual observer, who has known the species long enough to form a fair opinion, it indicates the quality of sportsmanship possessed by these gentlemen. To be sure, there has been now and then some good, lusty cussing at the inexorable umpire, who may be "Chance," but the game has never been seriously interrupted. It's "Smile, d— you, smile," and the players back in their places.

At a luncheon table surrounded by a half dozen or more of these philosophers and one stranger, the stranger would feel that he was being imposed upon if he were asked to believe that some were paying about a thousand dollars a month for the pleasure of continuing business at the old stand. Yet, such is the case, and the question is: Why is the situation in the heating business in Chicago as it is now at the close of the year 1911?

Not an easy question, that. Impossible to point the finger to this, that or the other circumstance and say: "This is the reason." For definite, clear-cut reasons do not exist.

Statistics for the year will probably show that in Chicago the building business has been good. No doubt they will show that the number of new buildings has been greater than last year and quite surely the total valuation will be considerably higher. A hasty conclusion, therefore, might be that as a whole the heating business must have been proportionately more extensive. A very sound conclusion, of course, but uninteresting because it is so perfectly obvious and does not explain the existence of the "Optimists' Club—Limited," nor the need for "Smile, d— you, smile" philosophy on the part of all outsiders.

In the absence of positive agencies more speculative theories will have to serve. Every man has these in abundance and quite likely this somewhat perplexing problem has been satisfactorily solved with a thousand different answers long before the following wiseacre conjectures shall be set up in type. However, they may agree with the theories of some one and he at least will be interested.

Each year the general character of building operations in Chicago differs somewhat. During 1911 the change has been pronounced as compared with other years. This condition is the basis of one theory to show why some have had and some have not.

Skyscrapers have sprung up in the "Loop" from every angle of vision. The record is far ahead of any other recent year. As usual, plums for the few the heating contracts on these operations. Others, lured by dreams of sudden affluence, have figured and hoped, only to be rewarded with expensive cost sheets and a resolution to "smile."

The number of better-class apartment buildings has increased. Contracts for these have fallen to the men that have been accustomed to handle the work on cheaper buildings of this class. The number of such cheaper buildings has been about the same, consequently these contractors generally have enjoyed an increase in business in proportion to the increase of the better class apartment buildings. Considerable factory and warehouse work has been under way and a few contractors have made a specialty of such heating installations. These are numbered among the Optimists.

Of residence work within the city there has been a falling off. Contractors who have builded their fame and fortune by catering to the home builders are prominent among the "Smilers."

Another theory that may be stated briefly is that some new talent has invaded the field and here and there as the months have rolled along they have had no timid scruples about slipping in a figure that has made the regulars cuss the umpire.

Of course, mere theories these, but as such politely and respectfully submitted as good as the next fellow's.

CHICAGO MASTER PLUMBERS HOLD ANNUAL MEETING.

The Chicago Master Plumbers' Association held its annual meeting Saturday evening, January 6th, at its headquarters in the Schiller Bldg., W. Randolph st., Chicago, and elected the following officers for the ensuing year: President, E. J. Benning; vice president, C. A. Dreier; treasurer, E. C. Wagner; secretary, J. C. Naughton; assistant secretary, Peter M. Munn.

MASTER PLUMBERS OF SYRACUSE, N. Y., ELECT OFFICERS.

The Master Plumbers' Association of Syracuse, N. Y., held its annual meeting Tuesday evening, January 2nd, and elected the following officers for the ensuing year: President, August Schall; vice president, L. V. Power; secretary, Chas. E. McCarthy; treasurer, Wm. Drexler; sergeant-at-arms, John Lavelle. The association has its headquarters at Room 207, Snow Bldg., which is in charge of W. V. Hipkens, clerk.

PHILADELPHIA MASTER PLUMBERS' ANNUAL BANQUET.

On Wednesday evening, January 10th, at Mosebach's Casino, was held the annual banquet of the Master Plumbers' Association of Philadelphia. Special preparations were made for the ladies, and a number of surprises awaited the members and guests. After a most enjoyable dinner and vaudeville performance, dancing was continued till an early hour. The committee in charge was composed of Harry B. Lentz, E. F. Roberts, S. Louis Barnes, Gregor Drummond, Robt. H. Pflug-Felder and Harry Bisbing.

Condon & Patton, Haddon Heights and Laurel Springs, N. J., engaged in the business of steam, hot-water and hot-air heating, are sending to their customers useful business calendars as incentives to good memory of their ability to serve throughout the year of 1912. The firm has attractive show-rooms at Haddon Heights and Laurel Springs and advertises the fact that it does garanteed sanitary plumbing.

"Domestic Engineering" Cartoon on "Self-Delusion"—LIX.

The Commercial Will-o'-the-Wisp

At Last I Am in Business for Myself!

If you want to possess a special proof of this or any other of our cartoons, let us have your request at once. We have many applications for our cartoons for framing and want to take good care of all demands made.

DEATH OF RICHARD T. CRANE.

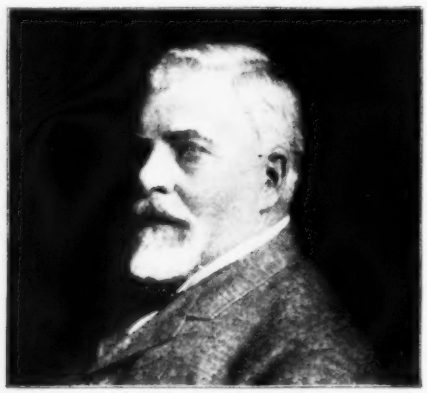
Richard T. Crane as Richard T. Crane is dead. Richard T. Crane as a life-force still lives.

Within a few months of attaining the age of 80, Mr. Crane died on January 8th as a result of heart-collapse due to a cold.

The name of Crane is well known to plumbers and steamfitters throughout the country and the news of the demise of the "ironmaster" as he was called will be read with regret by many of them.

Richard T. Crane was always a delight to astrological students. He fulfilled every delineation of the astrological signature of Taurus, credited to the date of his birth, May 15, 1832. Taurus is known as the Head Sign of the Earth Triune and its heritage is powerful physical construction, breadth of shoulder, massive head, strong will, much natural sympathy, industrial integrity and indomitable perseverance.

Mr. Crane's life has justified this heritage from his birthplace at Paterson, N. J., to his last day of life in Chicago. His parents were poor. He commenced work at seven years of age and at 15 took his first job in a brass foundry. In 1855 he opened a small brass shop of his own in Chicago. He slept in the loft. From this



The Late Richard T. Crane.

humble beginning, the present great Crane Co. has developed. The business grew, but more important still, Mr. Crane grew. He began to fight for what he believed was right in educational and social affairs, and, from 1890 to 1912, he has been constantly before the public at different times in three different roles—as a practiser of industrial profit-sharing, an advocate, founder and supporter of manual training schools and an iconoclast of colleges and universities. In the last role, on the day of his death, he released for publication a final vindictive attack on the University of Illinois.

As a profit-sharer, since 1900, when he started the plan, Mr. Crane has distributed over $3,000,000 among his employees on the basis of 10 per cent of the annual earnings of each workman.

As a supporter of manual training, Mr. Crane is recognized as the father of schools in Chicago devoted to this most valuable work. He spent over $100,000 carrying his theories into execution.

As an enemy of institutions of higher schooling, his name has become unduly known throughout the country. It is natural that a man of Mr. Crane's forceful character should be an extremist in utterance and action. Many people disapproved of his radical statements in his works condemning the centers of advanced education. These accusations will certainly bring about a purging of some of our college and university evils. The good that they possess will remain.

Mr. Crane's death terminates a perfectly rounded and generally consistent human career. To his workmen, he was paternal. He had a dominating personality; he seemed to have vivid powers of thought-transference in getting his orders obeyed. He was intensely executive, thoroughly in earnest in all he undertook, a keen observer of men and things and a student of scientific progress.

The following account of the funeral shows in how high a regard Mr. Crane was held by the citizens of Chicago:

Captains of industry and finance joined Thursday with thousands of workingmen in a final tribute to Richard T. Crane, the "ironmaster," who died Monday night. All over the world wherever the Crane company has an office or factory business was suspended and those who could not be in Chicago to participate in the funeral services paid their respects silently wherever they were.

Services were held at 10 a. m. at Trinity Episcopal Church, South Michigan avenue and East 26th street. The edifice was filled with representative Chicago business men and hundreds of employes of the Crane company. Men from the shops touched elbows with bank directors in a common grief. Some sections of the church were occupied entirely by men who have worked years for the company.

Floral Tributes Are Numerous.

The services at the church were in charge of the Rev. John M. McGann, the rector, assisted by the Rev. Z. B. Phillips, a former rector of Trinity Church. The music was furnished by a surpliced male choir. The Episcopal funeral service was read, there being no discourse. The floral tributes were so numerous as almost to conceal the pulpit and the windows of the church were banked with flowers.

The members of the family and other mourners occupied seats in the center of the church, while the honorary pallbearers were gathered on one side near the organ. As the funeral party entered there was a peal from the organ and the vested choir marched around the church singing "Holy, Holy, Holy, Lord God Almighty." The recessional hymn was "Onward, Christian Soldiers."

Former Employes Are Pallbearers.

The active pall bearers were men who have been active in the management of the Crane company—J. B. Berdyman, R. B. Stiles, Eugene Smith, J. H. Wrath, Peter Bothan, C. O. G. Wayman and J. C. Kilgore. The honorary pallbearers were: A. C. Bartlett, E. B. Butler, E. W. Blatchford, William A. Fuller, James B. Forgan, H. N. Higinbotham, Charles L. Hutchinson, Ernest A. Hamill, T. J. Lefens, William C. Magnus, A. D. MacGill, William A. Pope, Albert A. Sprague, Orson Smith, and Charles H. Wacker.

The burial was in the village cemetery at Lake Geneva, Wis., where Mr. Crane had his summer home.

The following persons accompanied the body to Lake Geneva, where burial took place: Mrs. Richard T. Crane, Mrs. Hutchinson (Mrs. Crane's mother), Mr. and Mrs. M. A. Ryerson, Mr. and Mrs. Charles R. Crane, Mr. and Mrs. R. T. Crane, Jr., H. P. Crane, Mr. and Mrs. E. A. Russell, Mr. and Mrs. P. R. Lillie, Mr. and Mrs. R. T. Crane, III., Mr. and Mrs. H. C. Bradley, Madison, Wis.; Mr. and Mrs. Robert W. Leatherbee, Mrs. Jessie D. Crane, Miss Dorothy Crane, Prentice Crane, Valentine Crane, C. R. Crane II., Allen Russell, Albert Lillie, Mr. and Mrs. F. D. Fenn, C. H. Fenn, H. P. Bishop, and Walter S. Rogers.

Cornelius Healy, the oldest employe of the Crane company, was also on the train.

PERSONAL MENTION.

Col. Fred J. Wagner, president of the F. J. Wagner Supply Co., 1869 Milwaukee Ave., Chicago, has been confined to his home by illness the last week. He says he doesn't know what's the matter, and he expects to be at his desk again in a day or two.

Walter Raymond McCoy, formerly connected with the Enos Co., 35th st. and 5th ave., New York City, is now associated with the Meyer-Sniffen Co., W. 36th st., in that city.

G. F. Yokom, of Minneapolis; M. L. Foote, of Columbus, O.; and T. J. Hester, of St. Louis, all representatives of the Iroquois Engineering Co., were recently in Chicago attending the company's annual meeting at its main office.

Harry O. Walker, until recently buyer for the heating department of Weil Bros., Chicago, has accepted the position as Eastern representative of the Peerless Heater Co., 177 N. State st., Chicago, with offices at 1133 Broadway, New York City.

Robert T. Shaw, the well-known master plumber, of Streator, Ill., who was seriously injured by falling bricks just before Christmas, while superintending plumbing work at the new factory building of Dorris & Co. in that city, is reported to be on the road to recovery, and it is expected that he will be able to be on deck again in a week or two.

KNOTT MFG. CO. SECURES THE SERVICES OF HARRY VERBEEK.

The Knott Manufacturing Co., Fort Wayne, Ind., manufacturers of water-closet tanks and seats, has secured the services of Harry Verbeek, 154 W. Randolph St., Chicago, as its representative in the central and western states. His long and favorable acquaintance with the jobbers, added to the reputation John T. Knott, president of the company, has for producing tanks and seats that the trade like, suggests increasing business for this enterprising company.

BROWN-WALES CO'S ANNUAL LUNCHEON.

The Brown-Wales Co., 69-83 Purchase st., Boston, Mass., gave a luncheon to its office force and salesmen on Saturday, December 30th. The luncheon was served in one of the company's offices and 25 men participated in the feast. Several speeches were made and the event was greatly enjoyed by all. The company has followed this custom of bringing its men together at a repast once a year for the last six years, and it has proved to be an enjoyable affair.

THE COMMITTEE ON STEAM-HEATING OF THE N. E. L. A.

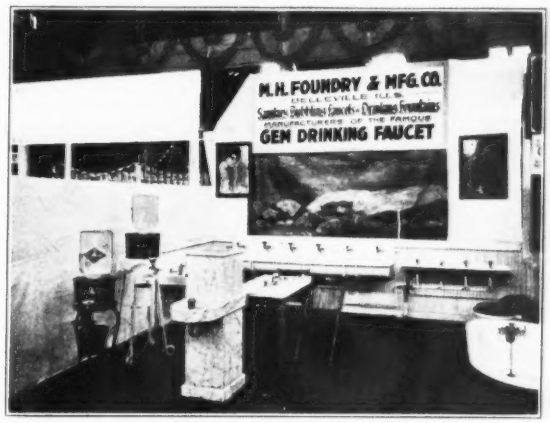
The officers of the commercial section of the National Electric Light Association have appointed a committee on steam-heating, for the purpose of securing information regarding the sale of steam-heat, with special reference to the commercial end of the business. The committee consists of S. Morgan Bushnell, chairman, 701, 112 W. Adams St., Chicago; A. D. Spencer, secretary, Edison Illuminating Co., Detroit, Mich.; H. M. Winter, Eugene Holcomb, E. F. Tweedy, Davis S. Boyden and Thos. Donahue. The committee will be glad to receive co-operation from all electrical companies engaged in the steam-heating business who can answer the following questions:

1. Do you heat by hot water or by steam?
2. If by steam, what is your net scale of prices per 1,000 lb. of steam?
3. Have you a scale of prices per season for flat-rate service? If so, how are your prices determined?
4. What is the average cost of coal per ton of 2,000 lb. in your town, also the average B. t. u. per lb. of coal?
5. Do you consider the business profitable at these prices? If not profitable, do the resultant advantages in the selling of electricity offset the losses on your steam business?
6. Do you have printed forms of contract for selling heat? If so, will you kindly furnish copies of same?
7. Do you furnish specifications to the consumer under which the equipment must be installed? If so, will you kindly furnish copy of same?

The work of this committee is an important one, and will have a definite influence on the work of the future, not only throughout the country, but possibly in your own town. If you have local information at hand, it will take only a few minutes of your time to answer as many of the questions as fully as possible. Write to either Mr. Morgan or Mr. Spencer.

AN ATTRACTIVE DRINKING-FOUNTAIN EXHIBIT.

The illustration shows an attractive exhibit of bubbling faucets and drinking-fountains made by the M. H. Foundry & Mfg. Co., Belleville, Ill., at the Health and Sanitary Exposition held at the Coliseum, St. Louis, at the latter end of 1911. The exhibit attracted considerable attention, and the company reports many inquiries as a result of its enterprise in making this educative display.



The M. H. Foundry & Mfg. Co's. Exhibit at the Health and Sanitary Exposition.

WANTS CATALOGS ON PLUMBING SUPPLIES.

M. Barde & Sons, Portland, Ore., are opening a plumbing-supply branch and request catalogs on goods pertaining to these lines.

HIGH-GRADE PUMPING APPARATUS FOR ALL KINDS OF SERVICE.

Yeomans Bros., 1141 Monadnock Bldg., Chicago, manufacture an excellent line of high-grade pumping apparatus for every variety of service, and are special contractors for sewage-purification and manufacturers of the Yeomans patent duplex electric sewage-ejector. With the increasing attention given to the effective removal of municipal sewage, sanitary engineers are often called upon to specify particular types of apparatus designed to overcome difficulties of grade or of location. The Yeomans sewage-ejector presents several specific advantages which should commend themselves to up-to-date plumbers and sanitary engineers who make a study of special office-building and residence problems. Many a basement, for instance, in large buildings could be rented to advantage if it could be kept dry under all conditions. A sewage-ejector installed in such a basement would pay for itself by the rental in a very short time, and there are abundant opportunities to install such devices in many down-town districts in cities and unfavorable locations in smaller towns. Special literature describing the Yeomans ejector in detail can be obtained upon application to Yeomans Bros. In writing, mention "Domestic Engineering."

Chicago, Ill.—Lewis & Kitchen, heating contractors and engineers, have moved their offices from 1200 So. Michigan Ave., to Suite 508 in the new Karpen Bldg., 900 So. Michigan Ave.

IMPORTANT MEETING OF THE ILLINOIS CHAPTER IN CHICAGO, JAN. 8, 1912.

One of the most important meetings yet held by the Illinois Chapter of the American Society of Heating and Ventilating Engineers, was held on January 8th at Vogelsang's, Madison street, Chicago. The eating part took place at Vogelsang's, the restaurant forming a rendezvous for the chapter's members and their guests before departure to the Teachers' College at the Chicago Normal School, 69th and Stewart avenue. There was an excellent attendance at the supper, at the conclusion of which the members were called to order by James M. Stannard, vice-president of the chapter. He announced with regret the absence of the chapter's president, S. R. Lewis, who was just recovering from a severe attack of tonsilitis. It is expected that Mr. Lewis will be on deck again in a few days.

On motion of Mr. Mehring, seconded by Mr. Patterson, the roll-call and regular order of business were dispensed with, in order to facilitate arrangements for a speedy departure. The object of the visit to the Teachers' College was to inspect the experimental room there representing the work of the Chicago Ventilation Commission, which is composed of three members of the Illinois Chapter—George Mehring, chairman; S. R. Lewis and W. L. Bronaugh,—and Dr. Young, Commissioner of Health of Chicago; Dr. Evans, ex-commissioner; Dr. Tonney, in charge of the municipal laboratories; and Prof. Shepherd, representing the Chicago Board of Education.

While the busses were arriving, Dr. Evans was called upon to make a short talk. He stated that the reason for his being asked to make a speech at that time was quite evident. He was not asked to speak because of what he had to say, but because of the chapter's preference to hear him rather than to give George Mehring the opportunity to crack a joke. Dr. Evans stated that the responsibility for failure of many systems of ventilation could not rightly be placed on the shoulders of the ventilating engineer. The blame should be borne equally by the architect, hygienist, owner and ventilating engineer. In most cases, the ventilating engineer had only been called upon to solve the problems submitted to him by the architect and hygienist, and he had solved them well. The ventilating engineer's problem has been to supply so many cubic feet per hour to a given space in connection with a given temperature. The problem has been purely mechanical, and if ventilation did not result, it was due not to the fault of the apparatus used or to the non-supply of air of demanded quantity, quality and temperature, but because the bases on which the hygienists built their ventilating systems are evidently at fault. Dr. Evans said he had complete faith in the ability of the ventilating engineer today to work out all the problems set before him. He is confident, however, that ventilation in its perfect state could only be obtained by the harmonious working together of architects, hygienists and ventilating engineers, and that independent action would only bring about additional confusion on the subject. He believes that as a result of movements of this kind true ventilation could be obtained.

Among the special guests of the chapter were: H. W. Tomlinson, representing the American Institute of Architects; Meyer J. Sturm, representing the Chicago Architects' Business Club; J. R. Firman and G. W. Hubbard, engineers to D. H. Burnham & Co.; J. B. Dibekla and J. C. Harding, representing the Board of Education; Dr. W. A. Evans and J. W. Shepherd, of the Chicago Ventilation Commission; Prof. Owens, principal of the Teachers' College; C. E. Beery, Board of Education, Rockford, Ill.; and Dr. F. O. Tonney, of the municipal laboratories.

The party proceeded in electric busses, arriving at the Chicago Normal School at 8:40 p. m. The experimental room was used as the lecture-hall. Vice-president Stannard introduced Prof. Shepherd as the first speaker to explain the character of the work being carried on in the room. Prof. Shepherd said that there was probably no branch of science about which more had been said with as little fact, and in which more conclusions have been drawn from as great a dearth of information. He pointed out the hasty methods of drawing conclusions, such as must result for instance from an attempt to reconcile such varying conditions as exist in Arizona and Chicago. Present-day science demands that there shall be a closer causal connection in investigative work and deduction.

The room under consideration is, as far as is known, the first of its kind in the world as an experiment-station in ventilation-methods. It is given over entirely to experimental work, and is occupied daily by four high-school classes of boys and girls. In its construction it has a false floor and a false ceiling. The floor is composed of two thicknesses of matched pine, between which are two thicknesses of tarred paper, the object being to secure as air-tight a floor as possible. The air is brought down the intake shaft under the floor. The ceiling is composed of brown pasteboard, located about six inches from the regular ceiling. The floor is pierced by holes in which are fitted 3-in. galvanized pipe admitting the air underneath each desk. The exit of the air is taken through similar holes in the false ceiling.

Prof. Shepherd stated that many things which were expected before the experimental work was carried out were found not to be true. There were great fluctuations of air-movements, due to conditions which had previously not been considered at all. For instance, a row of chairs, laid down in the room forming an aisle, would cause a distinct change of air-currents. Many experiments were made with toy balloons inflated with hydrogen gas and weighted with pieces of rubber tubing until they poised in the air of the room. They were started from the inlet-duct and it was noticed that instead of following the current as anticipated, in many cases the balloon would sometimes drop straight down when nearing a wall, due to the temperature difference through wall-chill.

Prof. Shepherd illustrated by flutter-mills placed at the three windows and on the desks of the school-room the upward and downward air-currents in the room, and the many possibilities of change of the current's direction by demonstrating the movement of a flutter-mill through influence from the heat of a hand only. One could readily understand, with a distinct air-current given off by the heated hand, how many factors had to be taken into consideration in the ventilation-problem, when one has to consider the supplying of fresh air in constant quantity and quality to many people in a confined space.

When first making tests of air-distribution by the present system through pipes blowing air under each desk, it was necessary to arrange to get some method of testing the efficiency of such distribution. In order to do this, lines were extended throughout the room immediately above the lines of ventilating pipes under the desks, and at about the height of the breathing-zone. Above these lines and across them at right-angles were extended another series of lines about three feet below the false ceiling. On these lines and suspended immediately above the desks were placed pieces of filter-paper saturated by a solution of phenolphthalein ($C_{20}H_{14}O_4$) which is peculiarly responsive to the action of alkaline substances. A handkerchief saturated with ammonia was then laid in the air-intake duct, and within 2¼ minutes every piece of filter-paper on the lower level had turned pink, and in three minutes the same effect was noted on the upper lines. This was done several times, and it was demonstrated that the inlets were delivering the air in fairly equal proportion throughout the room.

Having accomplished this, the next thing was to determine what temperature was desirable, with a certain known relative humidity. Prof. Shepherd said there are really two standards; the first calls for 68 deg. F. with a relative humidity of 70 deg., which might be called a standard of good health, and the second demands only that the individual keep warm, which might be called a standard of comfort. In actual practice, the standard of comfort would be the one which would be the most observed. The problem before the ventilating engineer, the hygienist and the architect is to bring these two standards as close together as possible.

The work of ascertaining the proportions of temperature and humidity is now being carried on. It is impossible yet to announce any definite conclusions. Prof. Shepherd exhibited, however, a chart showing how this work is being carried on. The rough sketch will give some idea of the method of plotting the reports of the pupils. Throughout the day testimonies are taken from the pupils as to whether they are too warm, too cold, or whether the air is too moist or too dry. These expressions of opinion are recorded as shown on the chart in connection with the temperature and humidity prevailing at the time they are made. The idea of these experiments is that by making a series of charts of this

kind over a considerable length of time and under varying atmospheric changes, accompanied by change of location on the part of the pupils, that eventually a near-standard of comfort and good health can be plotted out. The professor called attention to three of the desks in the rear of the room, in which a different method of introduction of the air was shown. The pipe, instead of coming up underneath the desk, came up at the back of it, and delivered the air upon the desk. In one case the air was blown out directly down on the desk; in the other upon the arms and hands of the worker, and at the third desk the air was blown into the face of the student. An objection was made by the pupil where the air was blown on the arms and hands, but in the other directions no complaint was registered. The ordinary method of introduction by means of a pipe under the desk was considered to be a good one, as air could be admitted without the danger of chilling the feet. The professor also theorized that the air striking the bottom of the desk would help in baffling back the dust kicked up by the feet. This of course is only a theory, but arrangements have been made to expose culture media at different levels in order to ascertain the facts in the case.

Prof. Shepherd then offered to answer any questions submitted to him. Among the various points brought out by such questioning were the following statements:

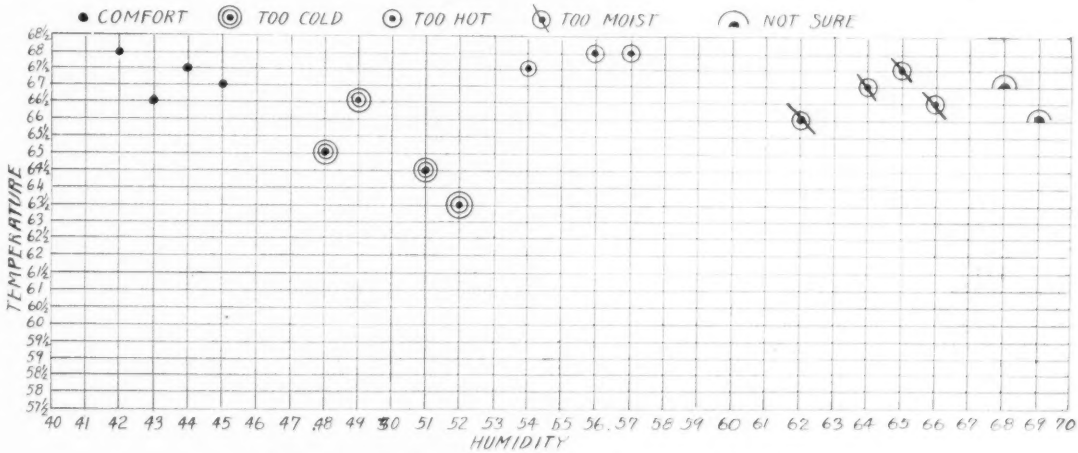
Registration by anemometer showed a velocity of introduction of air 35 cu. ft. per minute, and a lineal velocity ranging from 500 to 600 lin. ft. per minute. Temperature at the floor-level in the false floor and in the inlet were practically the same.

Dr. Tonney, Chief of the Municipal Laboratories, then spoke on the various tests that have been made to determine the amount of air that is required for the furnishing of satisfactory ventilation. Tests revealed that the volume of air could be cut down considerably and yet the proper proportion of CO_2 maintained. Dr. Tonney described the arrangement of the windows in the experiment-room. The first window was left as it was before the experiment was undertaken—in its natural condition. The second window was provided with a steam-pipe in front of the lower sash. The third was enclosed on three sides by steam-pipes. The object of this radiation was to determine the value of radiation so placed to counteract window-chill. Flutter-mills in each window by varying speeds demonstrated the real efficiencies of this radiation in accomplishing the work desired. Dr. Tonney was pleased to report that as a result of the present efforts of the architects, hygienists and ventilating engineers, the city of Chicago has been granted a Ventilation Inspection Department. The finance committee has made an appropriation for a ventilating engineer and five ventilating inspectors, and he hopes that the ventilating engineers will be able to recommend to Dr. Young a suitable man for the position, which carries with it a salary of $2,500 a year.

Meyer J. Sturm was called upon and he expressed his great satisfaction at this signal victory. He was chairman of the committee appointed by the society of architests to bring about this recognition of the city's ventilating needs, and was naturally pleased to hear that the efforts put forth had borne such good fruit. He referred to the unsatisfactory state of affairs which has existed in the matter of determining the proper ventilation of buildings, and took some exception to Dr. Evans' placing a good deal of the blame on the architects. The best the architect had been able to do had been to make suggestive blue and black pencil-scratches on the plans, showing where ventilation should be given, but there was no particular opportunity for any municipal enforcement of the idea presented by the pencil-scratches. Most of the architect's work along these lines has been a matter of conscience. There is every reason why the architect and the ventilating engineer should work together from now on, and the inspection department now secured would be a garantee that the ventilating designs they both insisted on should be cared for and maintained operative.

H. W. Tomlinson said that the chief trouble the architect had had was with the ventilating engineers, for it was impossible to find one who would agree with the other fellow as to what constituted proper ventilation methods. He modestly disclaimed any ability as an orator, and took the position of the impecunious darky who, when asked if he could change a $5 bill, replied: "No, sah, but I thanks you foh de compliment."

Dr. W. A. Evans enlarged somewhat on his brief talk after supper, and proceeded to diagnose the experiment room-conditions. He warned his hearers not to accept the things they saw in that room as a final demonstration. At the present stage of investigation it should be viewed merely as a trial of various methods advocated, with a view of finding out that best adapted to varying conditions. Dr. Evans believes that special attention should be given to the keeping warm of the feet of the occupants of a room. Of all animals in the world, man is the longest-legged. His feet are the furthest removed from his center of circulation. To this draw-back there must also be added a consideration of his sensitiveness, due to the habit of keeping the feet warm by covering them up. His hands and face have been trained for ages to stand varying temperatures, but if his feet are cold the rest of his body seems cold. The doctor also stated that if the air on the floor was at zero and air in the breathing-zone at 78 deg., a person would feel colder than if the temperature of the breathing-zone were 68 deg., and the temperature of the floor zero, due to the greater contrast between the temperatures. It was a sense of disproportion that marred comfort. Dr. Evans commended the work of the experiment-station, and saw in the temperature and humidity chart one of the most promising fields of investigation. He outlined some of the work that had been done before in this direction, and pointed out the great advantages that can accrue through the work of the new ventilating inspector and his force, if backed up and supported in the same manner that the



Professor J. W. Shepherd's Temperature and Humidity Chart.

work of the plumbing bureau and the plumbing inspector has been backed up and supported. In fact, the way for this work has really been "blazed" by the plumbing bureau." He urged his hearers to remember that, gratifying as it is to know that a ventilating engineer has been provided for and five ventilating inspectors, this does not mean for a moment that Chicago is going to have good ventilation. It simply means that they have a toe-hold. It would be as reasonable to expect perfect ventilation to be insured by such a small start alone, as it would be to expect a baby to do the work of a full-grown man. The ventilating engineers, the architects, and the hygienists of the city must work with the ventilating force if any good results are to be obtained. At present it is only a protoplasm of possibility, and unless it is supported most vigorously, an epitaph will be given to it such as was placed on the grave of a baby.

"What wast thou begun for

When thou wert so soon done for?"

He ventured to state that the work of an effective ventilation bureau would lower the present death-rate of 10,000 people yearly, now resulting from bad-air diseases.

Mr. Beery of Rockford, Ill., made some mention of the experiments being conducted by the Rockford board of education along similar lines. George Mehring then moved a vote of thanks to Prof. Shepherd for his able address on the experimental work, which was made a rising vote. Prof. Shepherd then introduced into the room live steam, so as to demonstrate to the members the existing air-currents. The return journey was made in the busses, and all the members expressed themselves highly confident of the promising future of the experimental ventilation-school and the valuable nature of the data it is collecting.

THE GEALY PIPE-WRENCH.

The Gealy pipe-wrench, manufactured by the Gealy Wrench & Mfg. Co., Grove City, Pa., will commend itself to the reader because of its manifestly powerful construction, and its novelty in chain-tong design. The construction is drop-forged carbon steel handle, and drop-forged high carbon steel jaws, the teeth being carefully tempered. The chain presents a flat link, with extremely high tensile strength, every part being interchangeable.

The wrench as shown in the illustration consists of a pair of alligator jaws, loosely mounted on a cam-lever, serving as a handle. The chain is permanently fastened to the handle, and when thrown around pipe, drops easily

The Gealy Pipe-Wrench.

into place in the jaws. The action of the cam-lever on the handle, with cam-thrust on the jaws, creates a powerful leverage by tightening the chain and engaging the pipe between the jaws and the chain. The pipe is not crushed. The release is immediate, owing to the loose mounting of the jaws on the handle, which allows the cam-lever to play freely on the cam-thrust. The chain being attached on one side of the handle and on the opposite side of the jaws makes release positive and instantaneous. The point to be noted is that there is no strain on the bolt joining the jaws and the handle. This bolt's only function is to hold them together when the tongs are not in use. The manufacturers will supply literature and fullest information on the Gealy wrench upon request In writing, mention "Domestic Engineering."

THE EUREKA GASOLINE WATER-HEATERS.

An interesting type of water-heater is the Eureka gasoline water-heater, manufactured by the Eureka Water-Heater Co., 37 West Lake St., Chicago. It is constructed entirely of seamless drawn brass and copper tubing, nickel-plated. It is non-corrosive and easy to keep clean.

In its construction the manufacturers claim that it possesses a unique feature in that it is provided with a water-jacket in which the water is pre-heated before entering the separate and distinct heating coils. The downward course of the water is very slow and in consequence the sediment in the water drops into the chamber at the bottom of the heater, from which it can be withdrawn through the pet-cock or flush-valve. The Eureka gasoline outfit can be applied easily to all types of hot-water tanks, and it should be easily sold to the countless users of gasoline in outlying districts and country homes. At least, that at first sight would seem to be the first avenue of opportunity. The Eureka Water-Heater Co., in addition, however, offers many interesting figures on the economy of gasoline water-heating as compared with heating by coal, and this enables the plumber and steam-fitter to talk Eureka utility in office buildings, factories, hotels and flat buildings. The Eureka gasoline outfit includes the heater proper, the gasoline burner, 6-gal. tank, air-pressure gage, brass floor-pump and the necessary wire and couplings. Special illustrated description will be supplied on application. Mention "D. E." in writing.

TRADE LITERATURE RECEIVED THIS WEEK.

The Bashlin Co., Warren, Pa., is sending to the trade a neat booklet illustrating and describing Bashlin valves and faucets. In the Bashlin valves, the disc and the seat-ring are both renewable. The seat-ring, the part most liable to damage, can be changed in the Bashlin valve while it is under pressure. The manufacturers claim that these advantages are peculiar to their products. These advantageous renewable features are to be found in all the Bashlin goods, such as globe, check, blow-off and radiator valves, and faucets. The Bashlin faucet can be repaired while under full pressure, and excessive force applied in closing the faucet cannot injure the rubber seat-ring in any way. Destructive action of grit is prevented by packing the water away from the screw-threads of the stem. The booklet will interest the reader from the variety of types it shows, and the careful description given of them. Other specialties of note are the compression faucets, basin and stop-cocks, and a self-closing basin-cock with non-squirting sanitary bubbler. Write for this booklet. There's good reading in it. Mention "Domestic Engineering" when you do so.

OBITUARY.

M. B. Barrett.

M. B. Barrett, of Montgomery, Ala., died suddenly of heart-failure in his plumbing establishment at 19 N. Lawrence St. in that city on Friday, December 22nd. He had complained of feeling ill about two days before his death, but persisted in attending to his work to the moment of his sudden demise. He was born in West Virginia 58 years ago and came to Montgomery from Tennessee in 1891. His wife died four years ago and he is survived by three sons and three daughters.

NEW ENGLAND NOTES.

Massachusetts.

Ipswich.—William Rand has moved his plumbing business from his old stand on South Main street to a new and more modern structure on Manning street, where he will be better able to care for the wants of his patrons.

Boston.—The Old North Church, more properly known as Christ Church, from the belfry of which the lanterns were hung which sent Paul Revere on his midnight ride, has again been opened to the public after the remodeling of its heating plant. The antiquated furnaces have been removed and an entirely new system installed.

Salem.—Inspector of Plumbing L. E. Millea has issued his annual report showing the following statistics: Permits granted, 416; water-closets 682, sinks 619, bath-tubs 360, basins 358, wash-trays 245; number of connections, new and old, 385; inspection in old houses, 511; in new houses, 947.

Boston.—Mayor Fitzgerald has approved a contract with the Spencer Turbine Cleaner Co. for installing a vacuum cleaning system in the U. S. Grant schoolhouse.

Chicopee.—The contract for installing a heating plant in the new Grape street engine-house has been placed with C. A. Ludden. There were three bidders.

Pepperell.—New plumbing is being installed at the New Prescott House for T. F. Graham.

Maynard.—F. A. Shaw, of Hudson, has the contract for heating and lighting the buildings on the A. J. Bacon estate, which are being extensively improved.

Easthampton.—Forbes, Hatch & Co. have just completed an extensive job of installing a heating plant in St. Ann's convent at Holyoke.

Vermont.

Ludlow.—Millard G. Bachelder has opened a plumbing and heating establishment in Brown's block. He is an experienced workman and will handle both new and repair work.

Maine.

Portland.—Communications have been addressed by the board of health to all master plumbers of the city urging co-operation in the matter of notifying the city plumbing inspector of the completion of jobs. This rule has not been complied with in many instances, according to the board of health, during the past year.

Connecticut.

Waterbury.—The Barlow Bros. Co. has been awarded the contract for the plumbing, heating and roofing for the new building to be erected on West Main street for the Mattatuck Historical Society.

Danbury.—Incorporation papers of the Bethe Garage & Plumbing Co. have been filed with the secretary of state at Hartford. The incorporators are: Ernest L. Taylor, Charles G. Anderson, Robert Halloran, Frederick Kirk, Herbert Leid and Charles Moore.

Hartford.—The city government has appropriated money to pay the salary of an assistant plumbing inspector, the duties of the office having become too much for one man.

Hartford.—A certificate of incorporation has been filed at the state house by the Cunningham-Schwerdle Co., of Bridgeport, the company to engage in the plumbing business in that city.

New Hampshire.

Manchester.—Superintendent of Schools Bickford has asked that new heating plants be installed in the Pearl street, Bakersville and Straw schools, estimating the cost at $5,000.

NEWS FROM OHIO.

Springfield.—The Patric-Furnace Co. has filed papers with the secretary of state increasing its capital stock from $40,000 to $75,000. The capital stock of the Victor Mantle Co. has been increased from $10,000 to $20,000. The concern manufactures gas mantles of all kinds. A. E. Fluidt is president and Lee R. Drake, secretary.

Toledo.—The Reuscher Mfg. Co. has been incorporated with a capital stock of $35,000 to manufacture pipe-threading machinery by David C. Wallets, Charles C. Kester, John V. Newton, Frank M. Schramm and Charles J. Reuscher.

London.—The board of education has adopted a resolution declaring it necessary to construct a central heating-plant at a cost of about $20,000 to provide for all of the school buildings in the city.

Cleveland.—The capital stock of the Scientific Heater Co. has been increased from $10,000 to $50,000.

Canton.—After several months of bickering and discussion, the city council has adopted an ordinance providing for the regulation and inspection of plumbing and drainage work. The ordinance provides that no one can engage in plumbing or drainage work without having secured a license from the municipality.

Columbus.—The new state boiler inspection law passed by the last general assembly became effective January 1st. Under it all stationary steam boilers will be rigidly tested by inspectors who are required to pass an examination. Charles H. Wirmel is at the head of the department.

Akron.—The courts have been asked to enjoin this city from securing its water supply from the Cuyahoga River. The suit was started recently by a number of manufacturing concerns which use water from that stream. The plaintiffs claim that they own all real estate along the river and dams and have been using them for 75 years.

PACIFIC COAST COMMENTS.

San Francisco.

The heating and plumbing business on the Coast has not yet regained its normal vigor after the usual holiday lull, nor have many of the large supply houses finished their stock-taking, and it will perhaps be a week or two longer before trade will improve perceptibly. Next week the new mayor takes office, together with a progressive board of supervisors, and shortly thereafter plans will probably be commenced for the construction of the municipal buildings included in the group for the civic center plan incidental to the Panama-Pacific Exposition

Despite the fact that the year 1911 was generally conceded to be an off year throughout the country, the records of building permits in the various large Coast cities in most instances show an increase in building values over the preceding year. The total for San Francisco is $20,915,484, an increase of about half a million over last year; Los Angeles, $23,004,185, an increase of about a million and a half; Oakland, $6,992,260, a slight increase; San Diego, $5,713,605, an increase of almost two millions; Sacramento, $3,087,392, an increase of three quarters of a million; Portland, Ore., $19,095,840, and Seattle, Wash., $7,491,156. These two latter cities show a considerable falling off in building values. When it is considered that at least 10 per cent must be added to the above amounts to cover the inevitable "extras" in construction-work, the showing of the Coast country in building operations for 1911 is very satisfactory. That the present year will show a great revival of prosperity is the opinion of most business men here.

The Mark-Lally Co. is now in the midst of the annual stock-taking, as are also the George H. Tay Co. and other houses accustomed to take their inventories at the first of the year. Without exception all the large firms express confidence for a big increase in business this season.

H. W. Finch, manager of the San Francisco branch of J. M. Kohler Sons' Co., expects to make a business trip to Los Angeles and the south early in January.

Williard C. Chamberlain, manager of the San Francisco office of the Standard Sanitary Manufacturing Co., who has been visiting the factory in Pittsburgh, Pa., is expected to be back in this city on January 10th.

Since opening a branch in San Francisco last March, the B. F. Sturtevant Co., whose manufacturing plant is located at Hyde Park, Mass., has enjoyed a large increase

in its Coast trade. Mr. Hardy, the Coast manager, states that he is highly satisfied with the results and that he is confident of much greater progress during this present year. Mr. Hardy is also president of the Union Blower & Engineering Co., which is a recent acquisition of the Sturtevant San Francisco company, and he reports a steady, normal business for this enterprise.

L. F. Halloran, of the Western Heating Co., is at present at Lincoln, Cal., supervising the installation of a steam drying system in the works of the Gladding McBean Terra Cotta Mfg. Co. The Western Heating Co. has been given a new contract to install additional apparatus at the same place.

A. S. Lamond, manager of the San Francisco branch of the Wolverine Brass Works, announces that this branch is now the distributing point for Oregon, Utah and Idaho, as well as the rest of the Coast territory. The new states will be handled by J. M. Campbell, a well-known man in the Coast plumbing supply trade, who will make his headquarters at Portland, Ore. The Wolverine company had a satisfactory business during 1911.

H. W. Moffat & Co., the Natoma street heating and ventilating firm, were the low bidders for installing a vacuum-cleaning system in the new high-school at Santa Rosa, Cal. They are agents for the well known McCrum-Howell Co., manufacturers of the "Richmond" vacuum cleaning apparatus.

Bids for the plumbing, heating and ventilating work of the Girls' High School will be opened on January 10th.

At the weekly luncheon of the Home Industry League of California on January 4th, at the Palace Hotel, Will J. French, a member of the State Industrial Board, spoke on the recently enacted employers' liability and workingmen's compensation laws.

Elsewhere on the Coast.

Portland, Ore.—The Pacific Blow Pipe & Heating Co., capital stock $5,000, has recently been incorporated.

Olympia, Wash.—Bids for the heating and plumbing work for the new municipal building at the corner of Third and Main streets, will be opened this week.

CENTRAL WISCONSIN MASTER PLUMBERS ORGANIZE.

Master plumbers from Rhinelander, Merrill, Antigo, Shawano, Waupaca, Stevens Point, Marshfield, Grand Rapids and Wausau, Wis., held a meeting in the latter city Thursday, January 4th, and organized the Central Wisconsin Benevolent, Social and Sanitary Club. The meeting was called to order by District Organizer M. P. Molter, of the plumbing firm of Hett & Molter, of Wausau, who welcomed the visiting plumbers to the city and explained the purpose of the meeting.

The organization was effected by the election of the following officers: President, Edw. L. Pine, Wausau; vice-president, J. E. Farley, Grand Rapids; secretary, H. I. Finch, Stevens Point; treasurer, George Meekma, Rhinelander.

George F. Reeke, Green Bay, Wis., president of the Wisconsin Master Plumbers' Association, attended the meeting and delivered a very interesting address on "The Duties and the Relation of the Plumber to the Public," in which he emphasized in strong terms the necessity of enforcing the legislation now on the statute books in the state of Wisconsin, relating to plumbing and its proper installation in all cities to which it applies, namely cities of the first, second and third class. The state supreme court has declared the law constitutional and within the jurisdiction of its police power. He advocated strongly calling the attention of the mayor and common council to the law which was passed in the year of 1898 and its enforcement in the city of Wausau. Among other things he said:

"The law compels every master and journeyman plumber to pass a rigid examination before being permitted to install plumbing and drainage, and provides for an inspector of plumbing to be appointed whose duty it is to pass upon all plumbing installations.

"There are a number of cities in the state at present working under this law, the rigid enforcement of which has saved countless lives of children and adults that formerly were subjected to indirectly inhaling poisonous sewer-air.

"A great deal of attention is being paid in passing pure food laws, health laws of various descriptions, even barbers are required to pass a state examination, but plumbing inspection and its proper installation are overlooked in the public's mad rush for business and its anticipated prosperity, and the desire to enjoy the luxury of extravagantly furnished homes, so that plumbing installations are only a secondary consideration, very often no regard being paid to the plumber whether or not the individual is capable or has the necessary qualifications to be admitted into the home to practice a profession considered by deep thinking professional men, doctors, nurses, etc., second to none in this great country of ours. Who has not seen children in their innocence congregated in the nauseating outhouses, where the deadly fly, mosquito and various disease-germs are being bred by the million, and is it not a wonder that so much disease of various natures is being spread and no attempt made by the city fathers to eradicate this evil, when so simple a matter as creating the office of plumbing inspector will wipe out this evil.

"Does the mayor, who is considered a progressive, energetic, high minded and enthusiastic official, realize the necessity of protecting citizens against the unscrupulous individual, who is permitted without restriction to do plumbing work unmolested; some of his class being found in nearly all communities where sanitary laws are not enforced.

"Does not the city council realize the necessity of urging the mayor to enforce the state plumbing law, which governs cities of the first, second and third class, in order to protect the citizens, their families and children from inhaling sewer-air in public buildings, schools, etc., in which plumbing work has been done; vitrified sewers installed that nine times out of ten are left in a leaky condition, the soil thereby becoming contaminated with disease-breeding germs, and the innocent children being compelled to breathe the air which may be permeated with contagious diseases.

"Do not the citizens themselves realize the necessity of clamoring for the enforcement of a law which is intended to protect the home of the rich as well as the homes of the poor workingmen, who toil in the factory, and who come home to find the mother, and the little ones threatened with typhoid fever, scarlet fever, diphtheria, etc.

"Perhaps the master plumbers are to blame for not placing so important a matter before the mayor, and common council, and showing them that the enforcement of sanitary regulations is not intended for pecuniary benefits to the master plumber, but intended to protect the health of the general public and stop the nefarious practice of installing light weight goods, skin plumbing, traps without vents, or perhaps, without traps of any kind.

"If it is necessary that all physicians, dentists, druggists, even barbers, pass examinations, and cities find it to their interest to have weigh masters, weed commissioners and sidewalk inspectors, it is by all means necessary to appoint a practical as well as theoretical plumbing inspector, whose duty it is to protect the entire community from inhaling poisonous sewer-air."

The meeting concluded with a banquet given by the local master plumbers' association.

The new club's next meeting will be held at Stevens Point, Wis., April 4, 1912.

NEW INCORPORATIONS.

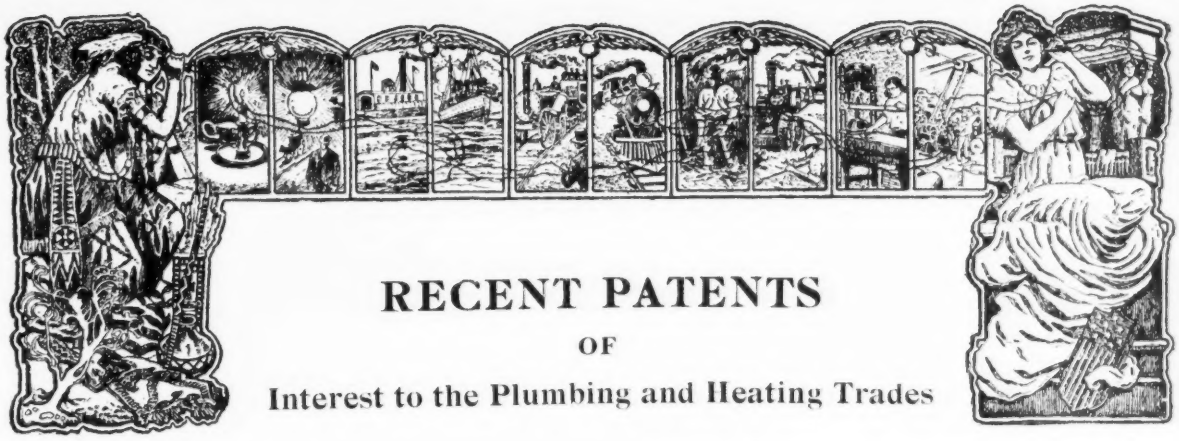
Among recent incorporations are the following:

Liability Plumbing Co., Oklahoma City, Okla.; capital stock, $5,000; incorporators, Thos. J. Wilson, Louis K. Phillips and A. D. McMullen.

Stafford Heating & Sheet Metal Co., Ashtabula, O.; capital stock, $10,000; incorporated by F. T. Walton.

Ney Bros., Chicago; capital stock, $15,000; incorporated by John Ney, Oscar Ney and John Ney, Jr., for the purpose of conducting a plumbing, gas-fitting, steam and water-heating business.

Burnap Bros. of Emporia, Kans., have just closed a contract for installing a Moline system in the David Gray Mason Gymnasium of Emporia College. The contract includes underground mains and provides capacity for eventually heating the entire group of buildings from one heating plant.



RECENT PATENTS

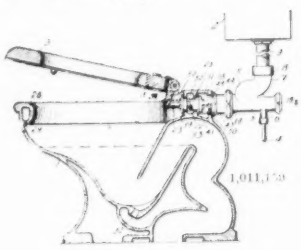
OF

Interest to the Plumbing and Heating Trades

Plumbing Department.

1,011,159. Water-Closet. John Clifford and John H. Gavin, Chicago, Ill., assignors to L. Wolff Manufacturing Company, Chicago, Ill., a corporation of Illinois. In a pressure-tank flushing-valve water-closet, the combination with a bowl having a washout channel and a flushing-rim channel and an opening intersecting said channels to receive the valve mechanism, of a valve-shell, supply-valve and flushing-valve, a hollow bushing and a connecting sleeve between said bushing and valve-shell, said hollow bushing and connecting sleeve having ports therethrough communicating with the flushing channel and washout channel of the bowl, and a disc surrounding said bushing and separating the flushing and washout ports from each other, and a port adjusting sleeve for regulating the flow of water to the flushing rim, said port adjusting sleeve fitting inside and being screw-threaded to said hollow bushing, substantially as specified.

1,011,364. Drinking-Cup Fountain. Frederick George Partington, Coeur d'Alene, Idaho. In a public drinking-fountain, the combination with a hollow stand, a bowl, an overflow channel leading from said bowl, an upstanding central hollow projection in said bowl having a flat upper face and projecting above the entrance to the overflow channel, a source of water-supply, a flexible tube coiled within said hollow stand, a cup adapted to have a seating upon the upper flat face of the upstanding projection to which cup one end of the tube is connected, the other end of said tube being connected to the source of water-supply.



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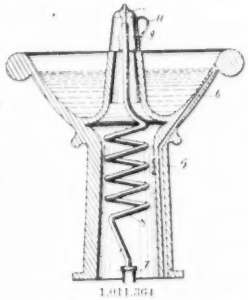

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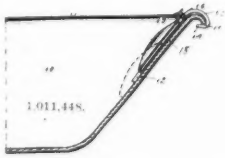

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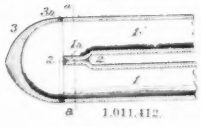
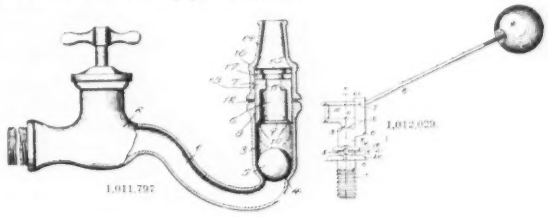


1,011,412.

1,011,448. Adjustable Head-Rest for Bath-Tubs. Janan Lahi, Atlantic, Ia. An improved head-rest for bath-tubs, comprising a frame formed of a single piece of wire or rod and comprising straight end portions, each having at one end a part curved downwardly to overlap the end of a bath-tub flange and then upwardly to pass under the end of a bath-tub flange, a central portion connecting the two upwardly curved portions, two yielding blocks slidingly mounted upon said straight portions to engage the top surface of a bath-tub, and a pillow or cushion slidingly mounted upon said straight ends.

1,011,412. Manufacture of Pipe-Bends. Francis J. Cole, Schenectady, N. Y. The improvement in the manufacture of pipe-bends which consists in swaging outwardly the walls of two pipe sections so as to provide plane contact faces at and adjoining their ends, welding said faces together, and welding a closing member to the connected ends of the two pipe sections.



1,011,797.

1,012,029.

1,011,797. Drinking-Fountain. Joseph B. Howell, East Walpole, Mass. A valve-housing, a valve in said housing, a nipple threaded in said housing having its inner end beveled and provided with notches, a nozzle threaded upon the outer portion of said nipple and tapered for a portion of its length, to form an internal seat, a netting resting upon said seat, and a gasket between said netting and nipple, said nipple clamping said netting and gasket in place.

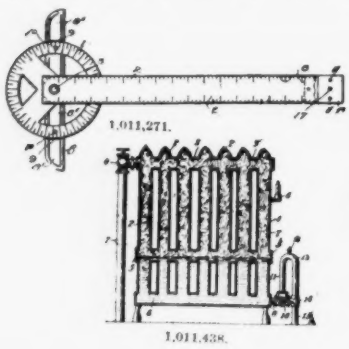
1,012,029. Ball-Cock. George Otis Thompson, Minneapolis, Minn. A ball-cock comprising a casing having a water-channel formed vertically therethrough, a ball-valve and a seat therefor, said seat being located in said water channel and said ball-valve controlling the passage of water through said water-channel, bearing extensions formed upon said casing, a float lever pivoted in said bearing extensions, a shop member carried by said bearing extensions and disposed in the path of movement of said float-lever, a plug having a slidable mounting within the casing above the ball-valve, and bearing loosely upon said ball-valve, an arm pivoted in said bearing extensions and comprising a boss having a rounded lower face which bears loosely upon said plug, said plug having no positive connection with either said arm or the ball-valve, and a link connecting the free end of said arm with the free end of the float-lever.

Heating Department.

1,011,328. Thermostat Damper-Regulator. Ruel E. Dewey, Grand Rapids, Mich. In a combination with a heat-generator having a damper, means for opening said damper, means for closing said damper, a thermostat having its movable terminal connected to a battery, conductors from said thermostat to respectively control the opening and closing means, a switch in the battery connection normally closing the same and adapted to shift the same to the connection for controlling the closing means, a thermal element moved by change of temperature and directly subjected to the heat of said generator, a tube carried by said element, a pin slidable in the tube, an adjustable screw in the tube engaging the pin and a lever operated by the pin to shift the switch.

1,011,271. Steam-Fitter Drafting-Machine. Thomas Tedesco, Peckville, Pa. In a device of the character described, the combination with a plate and a protractor-

blade integral therewith, said protractor-blade provided with apertures, of a detachable plate provided with lugs, said lugs extending into said apertures, and said plate provided with additional lugs extending outwardly or upwardly, guiding means provided with a plate, the last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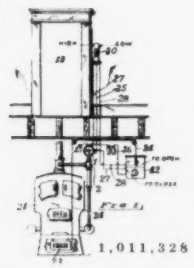
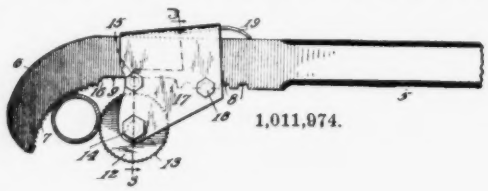

1,011,328

1,011,438.

mentioned plate engaging the outwardly-extending lugs of the detachable plate, and a section-lined device attached to said guiding means.

1,011,438. Heating Apparatus. Joseph W. Jones, Canton, Ohio. A heating apparatus of the character described comprising a steam-radiator having a steam-inlet communicating with a steam-supply, a steam-chamber consisting of a series of vertical sections having inter-communicating openings at the top and bottom, a communicating hot-water chamber comprising a series of vertical sections having inter-communicating openings at the top and bottom, means for maintaining the water-level within the inter-communicating openings at the bottom of said steam-chamber and means for drawing the water off from the bottom of said water-chamber.

1,011,974. Wrench. Willis S. Leighton, Biddeford, Me., assignor of one-third to Eurie L. Leighton and one-third to Herman J. Wentworth, Lawrence, Mass. In a wrench, a shank having flattened sides and at one end a fixed curved toothed jaw, and having a plurality of seats in its lower edge and a cut-away portion between the seats and the jaw, a U-shaped yoke stamped from sheet metal and straddling the shank, the forward edge of the con-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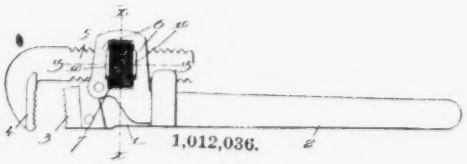
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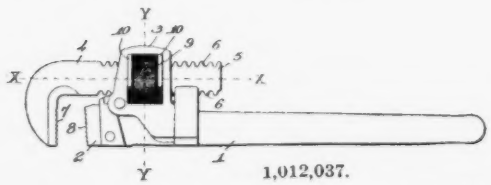
1,012,037.

necting portion of the yoke riding upon the upper edge of the shank, a bolt extending across the cheeks of the yoke and riding upon the cut-away portion of the shank, a second bolt extending across the cheeks of the yoke and adapted to seat in one of the said seats, a leaf spring riveted to the connecting portion of the yoke and lying flat against the said portion and projecting beyond the rear end of the yoke and bent to have its free end bear against the shank, a bolt extending across the cheeks of the yoke below the former bolt, and a toothed wheel mounted upon the latter bolt and forming with the said jaw a semi-crescent shaped socket, as and for the purpose specified.

1,012,036. Wrench. John H. Vinton, Boston, Mass., assignor to Trimont Manufacturing Company, Roxbury, Mass., a corporation of Maine. In a wrench, the combination with a wrench body, of a movable jaw having a screw-threaded shank, a nut screw-threaded to said shank, and a nut guard extending through the nut and provided with wing portions overlying the ends of the nut and projecting beyond the periphery thereof.

1,012,036. Wrench. John H. Vinton, Jamaica Plain, Mass., assignor to Trimont Manufacturing Company, Boston, Mass., a corporation of Maine. A wrench comprising a handle member provided with a jaw and a housing, a movable jaw member having a threaded shank sliding longitudinally in said housing, a nut in threaded engagement with said shank and held from longitudinal movement on said handle member by, and projecting from the sides of, said housing, a non-rotatable washer-like guard projecting beyond the periphery of the nut and adjacent the side thereof whereby when the wrench is laid upon or brought in contact with a bench or other surface the guard prevents the nut from being turned thereby.

Dignity of Rank.

Old World stickling for rank and precedence is well satirized by an incident which recently ocurred in Paris.

There was a fracas on the street, and two young men appeared to be about to fly at each other's throats, when one of them paused, folded his arms, looked contemptuous, and said:

"But I cannot fight with **him!**"

"Why not?"

"It's beneath my dignity."

"What do you mean?"

"He is only a coachman, and I am a *valet de chambre*."

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